CONESTOGA-ROVERS
& ASSOCIATES

651 Colby Drive, Waterloo, Ontario, Canada N2V 1C2
Telephone: 519·884·0510 Facsimile: 519·884·0525
www.CRAworld.com

May 17, 2011

Reference No. 039611

Mr. Rosauro del Rosario
EPA Project Manager/Coordinator
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604

Dear Mr. del Rosario:

Re: Interim Groundwater Monitoring Report
Himco Site, Elkhart, Indiana (Site)

Please find attached the Interim Groundwater Monitoring Report for the Himco Site. Conestoga-Rovers & Associates (CRA) has prepared this submittal on behalf of the Himco Site Trust for your review and approval.

CRA will provide electronic copies of the report following receipt of comments.

Should you have any questions, please call me at (519) 884-0510.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Denise Gay Quigley

DQ/cb/33
Encl.

cc: Doug Petroff, IDEM (2 copies)
Kevin Howe, USACE (3 copies)
Gary Toczylowski, Bayer HealthCare
Tom Lenz, Bayer HealthCare
Alan Van Norman, CRA (electronic)
Alan Deal, CRA

INTERIM GROUNDWATER MONITORING PROGRAM REPORT

HIMCO SITE
ELKHART, INDIANA

Prepared For:
Himco Site Trust

Prepared by:
Conestoga-Rovers & Associates

651 Colby Drive
Waterloo, Ontario
Canada N2V 1C2

Office: 519•884•0510
Fax: 519•884•0525

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1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to present the results of the Interim Groundwater Monitoring Program completed by Conestoga-Rovers & Associates (CRA), on behalf of the Performing Settling Defendants (PSDs) at the Himco Site, located in Elkhart, Indiana.

The Himco Site is a National Priorities List (NPL) site that is being remediated pursuant to a Consent Decree (Civil Action No. 2:07cv304 (TS)) (CD). The Statement of Work (SOW), included as Appendix B of the CD, specified the Remedial Action requirements for the Site. The SOW requires groundwater investigations to the east and southeast of the Himco Site and the implementation of a Groundwater Monitoring Program. CRA, on behalf of the PSDs, prepared a Remedial Design Work Plan that combined the East and Southeast Groundwater Investigations and the Groundwater Monitoring Program into a three-Phase Groundwater Investigation that builds incrementally to address the groundwater investigation and monitoring requirements of the SOW.

CRA submitted the Phase I and Phase II Groundwater Investigation Reports to the United States Environmental Protection Agency (USEPA) in May 2009 and October 2010, respectively.

1.2 BACKGROUND

The Site is a closed, unlicensed landfill located at the intersection of County Road 10 and the John Weaver Parkway (formerly Nappanee Street Extension) in Cleveland Township, Elkhart County, Indiana. The Site is approximately 60 acres in size, and accepted waste such as household refuse, construction rubble, medical waste, and calcium sulfate between 1960 and 1976. The landfill was closed in 1976.

Figure 1.1 shows the Site location. Figure 1.2 shows the layout of the Site, including property boundaries.

The Site consists of two major areas: the landfill, which is covered with calcium sulfate and a layer of sand, and the 4-acre construction debris area (CDA), located on the northern portion of seven residential properties and one commercial property that front onto County Road 10.

The Site was proposed for the NPL in 1988 and was placed on the NPL in 1990. The Remedial Design/Remedial Action (RD/RA) is being conducted pursuant to the CD, which became effective on November 27, 2007. The lead Agency for the Site is the USEPA Region 5. The Indiana Department of Environmental Management (IDEM) is the support Agency.

Section II, Paragraph 4.3 of the SOW describes the requirements for the groundwater investigation east and southeast of the Site. The purpose of the investigation is to delineate the contaminant plume emanating from the Site that may potentially be impacting the adjacent aquifer and water supply wells. The East and Southeast Groundwater Investigation and the Groundwater Monitoring Program were combined. Information regarding groundwater quality and groundwater flow directions from both areas is useful for interpreting local hydrogeologic conditions.

Section II, Paragraph 5 of the SOW describes the requirements for the Groundwater Monitoring Program intended to characterize the nature and extent of groundwater contamination beneath the Site. A network of 39 monitoring wells was described in the Supplemental Site Investigation/Site Characterization Report (USEPA, 2002) (SSI).

Section II, Paragraph 5.1 of the SOW states that the PSDs will submit a groundwater monitoring plan as part of the RD Work Plan, which will address the frequency of sampling, the wells to be sampled, and laboratory analyses to be performed. The SOW also requires that the wells be segregated into wells for detection monitoring and wells for compliance monitoring. Paragraph 5.1.4 further states that all groundwater wells associated with the Site shall be monitored for 10 years, but that an alternate schedule may be used if approved by USEPA.

CRA has investigated groundwater at the Site in phases based on the portion of the Site under investigation and the target depths of the investigation. A phased approach permits information collected during the initial stages of the investigation to guide subsequent phases of the investigation. The phased groundwater investigation included collecting vertical aquifer samples (VAS) to investigate the horizontal and vertical extent of groundwater contamination and monitoring wells for detection monitoring and for compliance monitoring. CRA collected groundwater quality and hydraulic monitoring data during the eight rounds of the Interim Groundwater Monitoring Program to evaluate the groundwater quality and flow in the vicinity of the Site.

The objectives of the groundwater investigations are to:

1. Delineate the horizontal and vertical extent of groundwater impact from the landfill around the perimeter of the landfill
2. Delineate 1,2-dichloropropane detected in a sample from the residential well at 54305 Westwood Drive, immediately east of the Site
3. Delineate an appropriate buffer zone east of the Site
4. Delineate groundwater contaminants that may have migrated south of the Site
5. Provide information required to design an appropriate monitoring well network

The Phase I Groundwater Investigation was the first stage of data collection and analysis and consisted of the following tasks:

- Historic data compilation
- Monitoring well reconnaissance and survey
- Baseline groundwater sampling
- VAS

The Phase II Groundwater Investigation consisted of the following tasks:

- Additional VAS
- New monitoring well installation

The Phase III Groundwater Investigation monitoring wells were installed in February and March 2011.

The Phase I Groundwater Investigation VAS focused on the southern and eastern edges of the landfill and downgradient areas to the south, southeast and east, and was limited to 150 feet in depth. Monitoring wells were installed at the Phase I VAS locations during the Phase II Groundwater Investigation. The VAS portion of the Phase II Groundwater Investigation focused on the southeast corner of the Site and downgradient to the southeast. The target depth of some of the Phase II VAS boreholes was bedrock, to investigate hydrogeologic conditions beneath the bottom depth of the Phase I VAS. The results of the Phase II Groundwater Investigation further refined the horizontal and vertical delineation of any plumes emanating from the Site, refined the definition of background groundwater quality, and defined appropriate locations and depths for sentry monitoring wells. The Phase III Groundwater Investigation will complete the monitoring well network and the groundwater investigation. This Interim Groundwater Monitoring Program report provides an evaluation of groundwater data collected at the Site with recommendations for the scope and frequency of future routine groundwater monitoring.

CRA has uploaded the database into an in-house software tool called e:DAT (electronic data access tool). The e:DAT for this Site can also be used to access aerial imagery, stratigraphic logs and relevant well construction diagrams. Appendix A includes a copy of the e:DAT.

1.3 REPORT ORGANIZATION

This report includes the following sections:

- Section 2.0 Describes the routine groundwater monitoring activities completed at the Site
- Section 3.0 Discusses groundwater elevation data collected in September 2010
- Section 4.0 Discusses groundwater quality data collected in September 2010
- Section 5.0 Summarizes the groundwater quality data collected for the Interim Groundwater Monitoring Program from October 2008 through September 2010
- Section 6.0 Provides the proposed scope and frequency for the Groundwater Monitoring program
- Section 7.0 Presents references cited in this report

2.0 INVESTIGATIVE ACTIVITIES

2.1 INTRODUCTION

This section describes the scope of groundwater monitoring activities completed at the Site during the Interim Groundwater Monitoring Program.

2.2 GROUNDWATER ELEVATION MONITORING

CRA has completed quarterly groundwater elevation monitoring rounds at the Site since October 2008. Data collected between the first quarter (Q1) and seventh quarter (Q7) were discussed in previous reports. Section 3.0 provides the results of the groundwater elevation monitoring completed on September 7, 2010 as part of the eighth quarterly (Q8) monitoring round. Table 2.1 is a summary of the status of the monitoring wells in the vicinity of the Site that are included in the routine groundwater elevation monitoring.

2.3 GROUNDWATER QUALITY MONITORING

CRA completed a Baseline Groundwater Sampling round from October 28, 2008 through November 6, 2008 and on November 18 and 19, 2008. The purpose of this sampling was to determine if the wells are capable of providing representative groundwater samples and to establish baseline groundwater quality conditions. Baseline Groundwater Sampling round represents the first routine quarterly groundwater quality monitoring round (Q1).

CRA completed the initial round of the Interim Groundwater Monitoring Program in February 2009. The following are the dates of the Interim Groundwater Monitoring Program sampling events CRA has completed at the Site to date:

- Interim Monitoring Groundwater Program (Q2) - February 9 to February 19, 2009
- Interim Monitoring Groundwater Program (Q3) - April 29 to May 6, 2009
- Interim Monitoring Groundwater Program (Q4) - August 4 to August 18, 2009
- Interim Monitoring Groundwater Program (Q5) - November 3 to November 11, 2009
- Interim Monitoring Groundwater Program (Q6) - February 23 to March 4, 2010
- Interim Monitoring Groundwater Program (Q7) – June 15 to June 24, 2010
- Interim Monitoring Groundwater Program (Q8) – September 8 to September 15, 2010

The primary goal of the Interim Groundwater Monitoring Program is to characterize the nature and extent of groundwater contamination beneath the Site. The Interim Groundwater Monitoring Program will be completed on a quarterly basis for 2 years. This report provides the results of the Interim Groundwater Monitoring Program after 2 years (eight quarterly events) and provides recommendations for the scope and frequency of any further groundwater monitoring.

Table 2.2 lists the monitoring wells included in the Interim Groundwater Monitoring Program. As noted in Table 2.2, the Himco Site Trust (Trust) did not have access to the background monitoring wells (WT102A, WT102B, and WT102C) and four of the monitoring wells along the northern Site boundary (WT112A, WT112B, WT113A, and WT113B) in June 2010. As USEPA is aware, the property owner (D&J Realty) denied the PSDs access to these wells as of June 2010.

As additional monitoring wells were installed in the course of groundwater investigations they were incorporated into the Interim Groundwater Monitoring Program. The monitoring wells installed during the Phase II Groundwater Investigation were included in the Q7 June 2010 round of the Interim Groundwater Monitoring Program and subsequent monitoring rounds. The monitoring wells installed during the Phase III Groundwater Investigation will be included in subsequent reports.

Table 2.3 provides the parameter list for the Interim Groundwater Monitoring Program. The parameter list includes Target Compound List (TCL) semi-volatile organic compounds (SVOCs), TCL volatile organic compounds (VOCs), Target Analyte List (TAL) metals and selected general chemistry parameters. TestAmerica Laboratories Inc. of North Canton, Ohio analyzed the groundwater samples. Analytical results for the Interim Monitoring Groundwater Program round Q8 are compiled in Appendix B. Appendix C provides laboratory reports and data validation memoranda. CRA validated the groundwater analytical data in accordance with the Quality Assurance Project Plan (QAPP) included in the Remedial Design Work Plan (CRA, 2008). Appendix D provides the stabilization parameters measured during groundwater sampling.

3.0 GROUNDWATER ELEVATION MONITORING

3.1 INTRODUCTION

CRA completed quarterly groundwater elevation monitoring rounds on:

- Q1 – October 27, 2008
- Q2 – February 9, 2009
- Q3 – April 28, 2009
- Q4 – August 3, 2009
- Q5 – November 2, 2009
- Q6 - February 24, 2010
- Q7 – June 14, 2010
- Q8 – September 7, 2010

Groundwater elevation contour maps for the Upper Aquifer, Intermediate Aquifer and Lower Aquifer based on data collected during the October 27, 2008 and February 9, 2009 events are in the Phase I Groundwater Investigation report (CRA, 2009). CRA included groundwater elevation contour maps based on data collected during the April 28, 2009 through February 4, 2010 events in the Himco Annual Groundwater Monitoring Report (CRA, 2010). CRA included data collected during the June 14, 2010 event in the Phase II Groundwater Investigation report (CRA, October 2010).

Figures 3.1, 3.2, and 3.3 present groundwater elevation contours derived from groundwater elevation data collected on September 7, 2010 for the Upper Aquifer, Intermediate Aquifer and Lower Aquifers, respectively.

3.2 UPPER AQUIFER

As shown on Figure 3.1, groundwater in the Upper Aquifer typically flows in a southerly direction. Overall groundwater flow is to the south, consistent with the regional groundwater flow pattern. The Upper Aquifer groundwater flow pattern on September 7, 2010 was similar to the groundwater flow pattern during previous monitoring rounds. Local features are occasionally superimposed on the regional flow pattern. For example, the groundwater elevation in monitoring well WT116A fluctuates and is occasionally on the order of 3 feet higher than nearby monitoring wells. However, on September 7, 2010 it was less than one foot higher. Therefore, the local groundwater flow divide that occasionally exists in the vicinity of WT116A, was absent on September 7, 2010.

Based on the September 7, 2010 groundwater elevation data, the horizontal hydraulic gradient in the Upper Aquifer was approximately 0.001 feet/feet.

3.3 INTERMEDIATE AQUIFER

Figure 3.2 shows that groundwater in the Intermediate Aquifer typically flowed south on September 7, 2010, consistent with the regional groundwater flow pattern and with the conditions during the previous monitoring rounds.

The groundwater elevation on September 7, 2010 in the Intermediate Aquifer monitoring well WT101B was approximately 1.4 ft higher than groundwater elevations in Intermediate Aquifer monitoring wells WT101D and WT101E, which are screened above and below WT101B, respectively. On June 14, 2010, the differential was approximately 0.3 ft. In 1990, USEPA installed WT101B in a layer of silty sand and sandy clay. WT101D and WT101E are screened in sand, which is typical of the Intermediate Aquifer. Therefore, higher groundwater elevations from monitoring well WT101B may not be representative of typical Intermediate Aquifer conditions.

Based on the September 7, 2010 groundwater elevation data, the horizontal hydraulic gradient in the Intermediate Aquifer ranged from 0.001 to 0.002 feet/feet.

3.4 LOWER AQUIFER

Figure 3.3 presents the results from the September 7, 2010 groundwater elevation monitoring event for the Lower Aquifer. These data indicate a south-southeasterly groundwater flow direction in the Lower Aquifer consistent with the regional groundwater flow pattern and with the conditions during the previous monitoring rounds.

Based on the September 7, 2010 groundwater elevation data, the horizontal hydraulic gradient across the Site was approximately 0.001 feet/feet in the Lower Aquifer.

3.5 VERTICAL HYDRAULIC GRADIENT

Figure 3.4 presents the vertical gradients between the hydrostratigraphic units as measured on September 17, 2010. There is generally an upward gradient across the Site, ranging from approximately 0.0003 feet/feet to 0.0031 feet/feet. CRA previously calculated intermediate vertical hydraulic gradients for monitoring well nest WT101 using data from WT101B. However, as described in Section 3.3, monitoring well WT101D is installed across a sandy interval that is more representative of the Intermediate Aquifer. As a result, vertical hydraulic gradient calculations now use WT101D as the representative monitoring well for the Intermediate Aquifer.

There is a slight downward gradient at monitoring well nest WT116. On June 14, 2010 there was a strong downward vertical gradient at WT116 due to a high groundwater elevation in the Upper Aquifer. With the exception of the vertical hydraulic gradient at WT116, the gradients observed during the Q8 – September 7, 2010 monitoring round were generally consistent with the conditions during the previous monitoring rounds.

4.0 Q8 ROUND INTERIM GROUNDWATER MONITORING PROGRAM RESULTS

4.1 INTRODUCTION

One of the objectives of the groundwater investigation and routine groundwater monitoring at the Site is to evaluate groundwater quality around the perimeter of the landfill, immediately east of the Site, and south of the Site. This section of the report describes the groundwater quality in the vicinity of the Site based on the results of the Q8 round of the Interim Groundwater Monitoring Program results.

CRA has provided iso-concentration contour maps (contour maps) for groundwater quality data. CRA created the contours using SURFER version 8 software. SURFER interpolates the groundwater quality data into a uniform grid and then draws contours. Where a compound was not detected CRA used half of the detection limit as a value for drawing the contours. However, where estimated concentrations, qualified with "J", were reported at concentrations less than the reporting detection limit, CRA used a value of 0.1 micrograms per liter (µg/L) for non-detect concentrations. The lowest contour was equal to the reporting detection limit (RDL). Some VOCs and SVOCs were not detected at concentrations greater than their RDL. In these cases CRA posted the results on a map but did not generate contours.

Analytical results for Q8 of the Interim Groundwater Monitoring Program are compiled in Appendix B. Appendix C provides laboratory reports and data validation memoranda for Q8 of the Interim Groundwater Monitoring Program. Appendix D provides stabilization parameters measured during the Q8 Interim Groundwater Monitoring Program round.

4.2 VOLATILE ORGANIC COMPOUNDS

In September 2010, CRA collected 35 groundwater samples from 33 monitoring wells for VOCs analysis. Table 4.1 summarizes the VOCs detected in groundwater samples collected during the Q8 round of the Interim Groundwater Monitoring Program. CRA reviewed the frequency of detections of the individual VOCs and screened VOCs results against Primary Maximum Contaminant Level MCL.

Benzene was the only VOC detected during the Q8 Interim Groundwater Monitoring Program round at a concentration greater than its Primary MCLs. CRA selected benzene for discussion purposes because it is the only VOC that was detected at a concentration greater than its Primary MCL. This is typical of previous monitoring rounds.

Only four VOCs were detected in more than 20 percent of the groundwater samples collected during the Q8 Interim Groundwater Monitoring Program:

- 1,1-Dichloroethane (1,1-DCA) = 42.9 percent
- *Vinyl chloride = 40.0 percent*
- cis-1,2-Dichloroethene (cis-1,2-DCE) = 31.4 percent
- Benzene = 22.9 percent

In an email correspondence regarding USEPA's August 19, 2010 comments on the Himco Annual Groundwater Monitoring Report (CRA, 2010), USEPA requested that the Phase II Groundwater Investigation Report include contour maps for all the organic compounds included in the trend analysis in the Himco Annual Groundwater Monitoring Report (CRA, 2010). As requested, CRA has included benzene, 1,1-DCA, cis-1,2-DCE, and vinyl chloride in the VOC results discussion of the Q8 Interim Groundwater Monitoring Program round. However, CRA did not construct contour maps for VOCs that were not detected in a given aquifer. For example, benzene was detected in groundwater samples collected from Upper and Intermediate Aquifer monitoring wells during the Q8 Interim Groundwater Monitoring Program but it was not detected in Lower Aquifer groundwater samples. Therefore CRA prepared contour maps for benzene in the Upper and Intermediate Aquifers but not the Lower Aquifer. The frequencies of detections of the selected VOCs in each aquifer are as follows:

	Number of Detections/Number of Samples		
	Upper Aquifer	*Intermediate Aquifer*	*Lower Aquifer*
1,1-DCA	8/14	7/17	0/4
Vinyl chloride	4/14	8/17	2/4
cis-1,2-DCE	1/14	4/17	0/4
Benzene	7/14	1/17	0/4

In the August 19, 2010 comments on the Himco Annual Groundwater Monitoring Report (CRA, 2010), USEPA requested that groundwater data for 1,1-DCA and carbon disulfide be screened against Regional Screening Levels (RSL) Tapwater. As indicated in CRA's September 15, 2010 response to USEPA's comments, USEPA agreed that RSL Tapwater values of 240 µg/L for 1,1-DCA and 10,000 µg/L for carbon disulfide are appropriate, since these calculated RSLs are based on a 1×10^{-5} excess cancer risk.

As requested, the analytical data for 1,1-DCA are compared to the calculated Tapwater RSL in Section 4.2.1.

4.2.1 1,1-DICHLOROETHANE (1,1-DCA)

As summarized in Table 4.1, 1,1-DCA was detected in 15 of 35 groundwater samples collected from the monitoring well network, or 42.9 percent of the samples. The concentrations in the samples where 1,1-DCA was detected range from 0.26 J µg/L to 5.7 µg/L. There is no MCL for 1,1-DCA. USEPA has requested that the Trust compare 1,1-DCA results to the calculated Tapwater RSL of 240 µg/L, which is based on an excess cancer risk of 1×10^{-5}.

Figures 4.1 and 4.2 provide the 1,1-DCA results for groundwater samples collected from Upper and Intermediate Aquifer wells, respectively, during the Q8 Interim Groundwater Monitoring Program. 1,1-DCA was not detected (RDL=1.0 µg/L) in groundwater samples collected from the Lower Aquifer monitoring wells, therefore, CRA did not construct a Lower Aquifer 1,1-DCA concentration map.

As shown on Figures 4.1 and 4.2, 1,1-DCA was detected in groundwater samples collected from Upper and Intermediate Aquifer wells WT101A, WT101B, WT101D, WT101E, WT111A, WT115A, WT116A, WT117A, WT117B, and WT117C, located along the southern Site boundary. 1,1-DCA was not detected at a RDL of 1.0 µg/L in groundwater samples collected from WT104A and WT105A, located south of the Site; however, 1,1-DCA was detected at a concentration of 1.6 µg/L in the groundwater sample collected from Upper Aquifer monitoring well WT106A, located south of the southeast corner of the Site. East of the Site, 1,1-DCA was detected in groundwater samples collected from Intermediate Aquifer monitoring wells WT114B and WT114C, but not Upper Aquifer well WT114A.

The maximum 1,1-DCA concentration detected in Q8 groundwater samples was 5.7 µg/L, which is significantly less than the calculated Tapwater RSL of 240 µg/L. The pattern of widespread, low-concentration 1,1-DCA detections along the southern Site boundary is not consistent with a distinct, high-concentration VOC source. Similar to the previous monitoring results, the distribution of 1,1-DCA in groundwater at the Site is more consistent with residual contamination undergoing degradation in the absence of ongoing contaminant loading.

4.2.2 CIS-1,2-DICHLOROETHENE (CIS-1,2-DCE)

Cis-1,2-DCE was detected in 11 of 35 groundwater samples collected during the Q8 Interim Groundwater Monitoring Program round, or 31.4 percent of the samples. The concentrations in the samples where cis-1,2-DCE was detected range from 0.23 J µg/L to 0.99 J µg/L. None of these concentrations were greater than the Primary MCL of 70 µg/L for cis-1,2-DCE.

The distribution of cis-1,2-DCE is almost identical to the distribution of 1,1-DCA (see Section 4.2.1). Cis-1,2-DCE was detected in groundwater samples from the following wells:

Well	*cis-1,2-DCE Concentration (µg/L)*
WT101A	0.41 J
WT101D	0.40 J
WT101E	0.23 J
WT106A	0.60 J
WT111A	0.68 J
WT114B	0.52 J
WT115A	0.35 J
WT116A	0.57 J
WT117B	0.38 J
WT117C	0.99 J/0.91 J(2)
(2) – duplicate sample	
J – estimated concentration	

Figures 4.3 and 4.4 provide the cis-1,2-DCE results from groundwater samples collected from Upper and Intermediate Aquifer wells, respectively, during the Q8 Interim Groundwater Monitoring Program. Cis-1,2-DCE was not detected (RDL=1.0 µg/L) in groundwater samples collected from the Lower Aquifer monitoring wells, therefore, CRA did not construct a Lower Aquifer cis-1,2-DCE concentration map.

As shown on Figures 4.3 and 4.4, cis-1,2-DCE was detected in groundwater samples collected from Upper and Intermediate Aquifer monitoring wells located along the southern Site boundary. South of the Site, cis-1,2-DCE was not detected (RDL=1.0 µg/L) in groundwater samples collected from Upper Aquifer monitoring wells WT104A and WT105A, but it was detected in the groundwater sample collected from WT106A, located south of the Site. Cis-1,2-DCE was not detected (RDL=1.0 µg/L) in Intermediate

Aquifer monitoring well WT106B, located south of the Site, but it was detected east of the Site in groundwater samples collected from Intermediate Aquifer monitoring well WT114B.

The maximum 1,1-DCA concentration detected in Q8 groundwater samples was 0.99 J µg/L,/0.91 J µg/L (duplicate sample) which is significantly less than the Primary MCL for cis-1,2-DCE of 70 µg/L. The pattern of widespread, low-concentration cis-1,2-DCE along the southern Site boundary detections is not consistent with a distinct, high-concentration VOC source. Similar to the previous monitoring results, the distribution of cis-1,2-DCE in groundwater at the Site is more consistent with residual contamination undergoing degradation in the absence of ongoing contaminant loading.

4.2.3 VINYL CHLORIDE

As shown in Table 4.1, vinyl chloride was detected in 14 of 35, or 40.0 percent, of the samples CRA collected during the Q8 Interim Groundwater Monitoring Program round. When vinyl chloride was detected, its concentration in groundwater samples ranged from 0.36 J µg/L to 1.5 µg/L, as follows:

Well	*Vinyl Chloride Concentration (µg/L)*
WT101A	0.42 J
WT101B	0.85 J/0.76 J(2)
WT101E	0.42 J
WT106B	1.0
WT111A	0.36 J
WT116B	0.56 J
WT117B	0.57 J
WT117C	1.5/1.5(2)
WT118B	0.54 J
WTB4	0.65 J
WTE1	0.70 J
WTE3	0.90 J
(2) – duplicate sample	
J – estimated concentration	

Figures 4.5, 4.6, and 4.7 provide the vinyl chloride results from groundwater samples collected from Upper, Intermediate and Lower Aquifer monitoring wells, respectively, during the Q8 Interim Groundwater Monitoring Program.

As shown on Figure 4.5, vinyl chloride was detected in groundwater samples collected from WT101A, WT111A and WT117C, located along the southern edge of the Site. Vinyl chloride was not detected (RDL=1.0 µg/L) in any groundwater samples collected from the off-Site Upper Aquifer monitoring wells.

Figure 4.6 shows that vinyl chloride was detected in groundwater samples collected from Intermediate Aquifer monitoring wells located along the southern Site boundary. Vinyl chloride was also detected in the groundwater sample from Intermediate Aquifer monitoring well WT106B, located south of the Site, but it was not detected (RDL=1.0 µg/L) in groundwater samples collected from Intermediate monitoring wells WT114B, WT114C, WT120A, and WT120B, located east of the Site.

As shown on Figure 4.7, vinyl chloride was detected in groundwater samples collected from Lower Aquifer monitoring well WTB4, located in the northwest corner of the Site and Lower Aquifer monitoring well WTE3, located along the southern Site boundary. It was not detected (RDL=1.0 µg/L) in the other groundwater samples collected from Lower Aquifer monitoring wells.

None of the Q8 Interim Groundwater Monitoring Program vinyl chloride concentrations were greater than the Primary MCL of 2 µg/L. The widespread low level vinyl chloride detections do not suggest a distinct source with a high concentration VOC plume emanating from the landfill. Vinyl chloride is produced in reducing conditions by the degradation of chlorinated organic compounds such as trichloroethene (TCE). The distribution of vinyl chloride in groundwater in the vicinity of the Site is more consistent with residual contamination undergoing degradation, probably with no ongoing source of VOC contaminants.

4.2.4 BENZENE

As shown in Table 4.1, benzene was detected in 8 of 35, or 22.9 percent, of the Q8 Interim Groundwater Monitoring Program groundwater samples. The concentration of benzene ranged from 0.24 J µg/L to 10 µg/L.

Since 2008, the concentration of benzene was greater than the Primary MCL of 5 µg/L in eight of the eleven Q1 through Q8 groundwater monitoring samples collected from monitoring well WT115A. The benzene results from groundwater samples collected from WT115A since 2008 range from 1.0 U µg/L /0.43 J µg/L (duplicate sample) to 12 µg/L. Data qualified with "U" indicate that the analyte was analyzed but was not detected above the reported sample quantitation limit. As shown on Figure 4.8, monitoring well WT115A is located in the southeast corner of the landfill and is within the limit of waste.

Benzene was also detected in the Q8 Interim Groundwater Monitoring Program samples collected from six other monitoring wells, as follows:

Well	*Range of Concentrations (µg/L)*
WT101A	3.6
WT106A	0.24 J
WT111A	0.66 J
WT115A	10
WT116A	2.1
WT117B	0.79 J
WT117C	0.64 J/0.61 J(2)
(2) – duplicate sample	
J – estimated concentration	

Figures 4.8 and 4.9 provide the benzene results from groundwater samples collected from Upper and Intermediate Aquifer monitoring wells during the Q8 Interim Groundwater Monitoring Program. Benzene was not detected (RDL=1.0 µg/L) in groundwater samples collected from the Lower Aquifer monitoring wells, therefore, CRA did not construct a Lower Aquifer benzene concentration map.

Five of the six monitoring wells where benzene was present in groundwater samples are in the Upper Aquifer with WT117B in the Intermediate Aquifer. As shown on Figures 4.8 and 4.9, most of the Upper and Intermediate Aquifer monitoring wells where benzene was detected are located along the southern limit of waste. The exception is Upper Aquifer monitoring well WT106A, located south of the southeast corner of the Site.

The maximum benzene concentration detected in Q8 groundwater samples was 10 µg/L, which is greater than the Primary MCL of 5 µg/L. The distribution of benzene suggests a relatively weak, local source of benzene possibly in the vicinity of WT115A. This is consistent with previous Interim Groundwater Monitoring program results.

4.3 SEMI-VOLATILE ORGANIC COMPOUNDS

CRA collected 35 groundwater samples from 33 monitoring wells for SVOCs analysis during the Q8 round of the Interim Groundwater Monitoring Program. Table 4.2 summarizes the SVOCs detected in groundwater samples collected during the Q8 round of the Interim Groundwater Monitoring Program. CRA reviewed the frequency of detections of the individual SVOCs and screened SVOCs results against Primary MCLs.

Ten SVOCs were detected in the Q8 Interim Groundwater Monitoring Program groundwater samples. The detection frequency of these compounds ranged from 2.9 percent to 25.7 percent.

Bis(2-ethylhexyl)phthalate is the only one of the ten detected SVOCs that has a Primary MCL (6 µg/L). Bis(2-ethylhexyl)phthalate was detected in 9 of 35, or 25.7 percent of the Q8 Interim Groundwater Monitoring Program groundwater samples. The concentrations in the samples where bis(2-ethylhexyl)phthalate was detected range from 0.86 J µg/L to 3 µg/L. Figures 4.13, 4.14, and 4.15 show the bis(2-ethylhexyl)phthalate results from groundwater samples collected from Upper, Intermediate and Lower Aquifer monitoring wells, respectively, during the Q8 round of the Interim Groundwater Monitoring Program.

As shown on Figure 4.13, the maximum concentration of bis(2-ethylhexyl)phthalate in the groundwater samples collected from Upper Aquifer monitoring wells during the Q8 round of the Interim Groundwater Monitoring Program was 1.1 J µg/L in the sample collected from Upper Aquifer monitoring well WT106A, which is located south of the south east corner of the Site. Bis(2-ethylhexyl)phthalate was also detected in groundwater samples colleted from Upper Aquifer monitoring wells WT117A (0.98 J µg/L) and WT117C (0.90 J µg/L/1.3 J µg/L, duplicate sample). Bis(2-ethylhexyl)phthalate was not detected (RDL=2.0 µg/L) in any other groundwater samples collected from Upper Aquifer monitoring wells.

As shown on Figure 4.14, the maximum concentration of bis(2-ethylhexyl)phthalate in the groundwater samples collected from Intermediate Aquifer monitoring wells during the Q8 round of the Interim Groundwater Monitoring Program was 1.4 J µg/L in the sample collected from Intermediate Aquifer monitoring well WT118B which is located along the southern Site boundary. Bis(2-ethylhexyl)phthalate was also detected in groundwater samples colleted from Intermediate Aquifer monitoring wells WT117B (1.2 J µg/L) and WT120B (0.86 J µg/L). Bis(2-ethylhexyl)phthalate was not detected

(RDL=2.0 μg/L) in any of the other 14 groundwater samples collected from Intermediate Aquifer monitoring wells during the Q8 round of the Interim Groundwater Monitoring Program.

Figure 4.15 shows the results of Bis(2-ethylhexyl)phthalate analysis of groundwater samples collected from Lower Aquifer monitoring wells during the Q8 round of the Interim Groundwater Monitoring Program. Bis(2-ethylhexyl)phthalate was detected in two of four groundwater samples but at concentrations less than the Primary MCL of 6 μg/L.

The Q8 Interim Groundwater Monitoring Program bis(2-ethylhexyl)phthalate results are typical of past monitoring results. In previous monitoring rounds, bis(2-ethylhexyl)phthalate was typically detected at low concentrations in groundwater samples that were widely dispersed, both laterally and vertically. The bis(2-ethylhexyl)phthalate detections were also intermittent and did not occur routinely in the groundwater samples collected from any given monitoring well. This is not the pattern that a distinct, high concentration source of SVOCs would create, namely a plume emanating from the landfill. In fact, the presence of bis(2-ethylhexyl)phthalate at relatively large distances both upgradient and downgradient of the Site suggests that the detected values at the Site may not be completely, if at all, attributable to Site activities.

4.4 METALS

4.4.1 INTRODUCTION

CRA collected 35 groundwater samples from 33 monitoring wells for TAL metals analysis during the Interim Groundwater Monitoring Program Q8 monitoring round. Tables 4.3 through 4.5 summarize the metals detected in the groundwater samples collected from the Upper, Intermediate and Lower Aquifers, respectively, during the Interim Groundwater Monitoring Program Q8 monitoring round. CRA's approach to screening organic chemicals was different than the approach to screening metals and general chemistry parameters because organic chemicals are typically the result of waste disposal activities while metals and general chemistry parameters also occur naturally in groundwater. Also, two of the contaminants of concern (CoCs), iron and calcium, are mineral nutrients and drinking water can provide a viable fraction of the total intake.

CRA analyzed groundwater samples collected from monitoring wells WT102A, WT102B, and WT102C, located approximately 1,260 feet north and upgradient of the Site for metals and general chemistry parameters. The Himco Annual Groundwater

Monitoring Report (CRA, 2010) included a statistical analysis of these data to determine background concentrations to compare with values measured at other locations at the Site. Tables 4.3 through 4.5 summarize the background values (BVs) for metals parameters for the Upper, Intermediate, and Lower Aquifers.

The Phase I Groundwater Investigation (CRA, 2009) identified the following data gap:

> *Additional background groundwater quality data will be collected during the course of the Interim Groundwater Monitoring Program in order to have at least 8 data points available to calculate the background values (BVs), primarily in the Intermediate and Lower Aquifer background wells. CRA will include the recalculated BVs in the Phase II Groundwater Investigation Report.*

As of March 2010, CRA had collected six to seven data points for each background parameter. In June 2010, prior to the Q7 Interim Groundwater Monitoring Program round, the owner of the properties where the background monitoring well nest (WT102A, WT102B and WT102C) is located denied the Himco Site Trust access to the wells. CRA understands that USEPA has contacted the property owners (D&J Realty) and is attempting to secure access to these wells.

Although CRA previously identified the BVs presented in Tables 4.3 through 4.5 as preliminary, no additional data can be collected until access to the background wells is secured. CRA will recalculate the BVs, as appropriate, if more data become available, and will include the results in subsequent groundwater investigation reports.

The CD states that the Remedial Action Objectives for groundwater (GW RAOs) are to prevent the use of groundwater that contains Site-related carcinogens and non-carcinogens in excess of MCLs. The CD also states that the GW RAOs are:

> *To prevent the use of groundwater which contains site-related sodium, calcium, and iron in excess of their upper intake limit or recommended dietary allowances for sensitive populations.*

Initially CRA screened the metals data against the primary MCLs. There are no primary MCLs for sodium, calcium and iron. There are secondary MCLs for sodium [250 micrograms per liter (mg/L)] and iron (0.3 mg/L), but these are aesthetic criteria and are not health based. There is a health-based RSL Tapwater for iron of 26 mg/L. The recommended daily allowance (RDA) for calcium is 250 mg/L. In order to establish appropriate GW RAOs, CRA ranked these criteria as follows:

1. Primary MCLs
2. RSL Tapwater
3. RDA
4. Secondary MCLS

For example, there is no Primary MCL for iron, so the next level of criteria is the health based RSL Tapwater of 26 mg/L. There is no Primary MCL, RSL Tapwater or RDA for sulfate. Therefore, the best available criterion is the Secondary MCL of 250 mg/L.

Magnesium, nickel, potassium and bromide do not have a Primary MCL, RSL Tapwater, RDA, or a Secondary MCL. Therefore, CRA did not establish a GW RAO for these analytes.

4.4.2 PRIMARY MCLs

Tables 4.3, 4.4, and 4.5 provide the range of concentrations and the frequency of detection of the metals and general chemistry analytes in the samples collected from Upper, Intermediate and Lower Aquifer monitoring wells, respectively, during the Q8 round of the Interim Groundwater Monitoring Program.

In the case of arsenic the BVs for all three aquifers are lower than the primary MCL (10 µg/L). Therefore, the GW RAO for arsenic is the primary MCL. Arsenic was the only metal detected at a concentration greater than its Primary MCL in the Q8 Interim Groundwater Monitoring Program groundwater samples.

The concentration of arsenic was greater than its Primary MCL of 10 µg/L in the Q8 Interim Groundwater Monitoring Program groundwater samples collected from Intermediate Aquifer monitoring wells WT106B (11.6 µg/L), located south of the Site, and WT114C (20.4 µg/L), located east of the Site. Figure 4.16 shows the distribution of arsenic in the Intermediate Aquifer. The Q8 Interim Groundwater Monitoring Program results are consistent with the previous monitoring rounds, which include rare, widespread and inconsistent exceedances of the Primary MCL for arsenic. However, monitoring wells WT106B and WT114C are Phase II monitoring wells and the Q8 Interim Groundwater Monitoring Program represents only the second sampling event at these wells. Continued monitoring is required to evaluate the groundwater quality with respect to arsenic in samples collected from these wells.

There is no Primary MCL for lead but there is an action level[1] (15 µg/L) established by USEPA in lieu of a Primary MCL. The BVs for lead in all three aquifers are lower than the action level. Therefore, the GW RAO for lead in all three aquifers is the action level. Lead was detected in a single Q8 Interim Groundwater Monitoring Program groundwater sample. The concentration of lead in the Q8 Interim Groundwater Monitoring Program groundwater sample collected from Upper Aquifer monitoring well WT115A, located in the southeast corner of the Site, was 10.5 µg/L, which is less than the action level[1] (15 µg/L). As discussed in Section 5.4.1, lead was routinely detected in the Interim Groundwater Monitoring Program samples collected from WT115A and the concentration of lead is typically less than the action level.

4.4.3 CALCIUM

Tables 4.3, 4.4, and 4.5 indicate calcium was detected in all 35 groundwater samples collected during the Q8 Interim Groundwater Monitoring Program round. Calcium concentrations were greater than the GW RAO in 2 of the 35 groundwater samples, or 5.7 percent. Figures 4.17, 4.18, and 4.19 provide calcium concentrations in the Upper, Intermediate and Lower Aquifers, respectively.

Figure 4.17 presents calcium concentration contours for the Upper Aquifer. The RDA for calcium is 250 mg/L. The Upper Aquifer BV is 275 mg/L for calcium. Therefore, the GW RAO is equal to the BV of 275 mg/L. There is a plume of calcium in the Upper Aquifer defined by the GW RAO of 275 mg/L. The peak calcium concentration in the Upper Aquifer during the Q8 Interim Groundwater Monitoring Program round was 617 mg/L in a groundwater sample collected from monitoring well WT116A. The concentration of calcium also exceeded the GW RAO in the groundwater sample collected from WT101A, located in the southeast corner of the Site. Calcium concentrations in excess of the RDA did not extend off Site in the Upper Aquifer. This is similar to previous monitoring results.

Figure 4.18 presents the concentration of calcium in groundwater samples collected from Intermediate Aquifer monitoring wells during the Q8 Interim Groundwater Monitoring Program. The BV for calcium in the Intermediate Aquifer is 86 mg/L. The RDA for calcium is 250 mg/L. Therefore the GW RAO for calcium in the Intermediate Aquifer is

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1 Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10 percent of tap water samples exceed the action level, water systems must take additional steps. For lead, the action level is 0.015 mg/L. The action level is discussed herein because there is no Primary MCL for lead. The action level applies to public water treatment facilities, and is included herein for discussion purposes only.

equal to the RDA. The concentration of calcium in Intermediate Aquifer groundwater was less than the GW RAO of 250 mg/L, with a maximum detected concentration of 181 mg/L in a groundwater sample collected from monitoring well WT117B, located along the western end of the southern Site boundary. Similar to previous monitoring rounds, calcium concentrations greater than the RDA in the Intermediate Aquifer are rare. Northeast of the WT101 monitoring well nest, calcium concentrations are generally less than the BV. There is a general trend of increasing calcium concentration in groundwater to the southwest in the Intermediate Aquifer.

Figure 4.19 presents the concentration of calcium in groundwater samples collected from Lower Aquifer monitoring wells. The BV of 122 mg/L for the Lower Aquifer is less than the RDA of 250 mg/L. Therefore the GW RAO for calcium in the Lower Aquifer is equal to the RDA. The concentrations of calcium in Lower Aquifer groundwater samples from the Q8 Interim Groundwater Monitoring Program round were less than GW RAO. The concentration of calcium in the samples collected from the Lower Aquifer monitoring wells ranged from 45 mg/L in a groundwater sample collected from monitoring well WTB1, located in the northwest corner of the Site, to 72.9 mg/L in a groundwater sample collected from monitoring well WTE3, located on the southern Site boundary. The Q8 Interim Groundwater Monitoring Program Lower Aquifer calcium results are consistent with previous results that are only occasionally greater than the GW RAO.

4.4.4 SODIUM

Tables 4.3, 4.4, and 4.5 provide summaries of the metals results for Q8 Interim Groundwater Monitoring Program round including sodium. Sodium was detected in all 35 groundwater samples collected during the Q8 Interim Groundwater Monitoring Program round. Sodium concentrations were greater than the GW RAO in 2 of the 35 groundwater samples, or 5.7 percent. Figures 4.20, 4.21, and 4.22 provide sodium concentrations in the Upper, Intermediate and Lower Aquifers, respectively.

Figure 4.20 presents sodium concentration contours for the Upper Aquifer. The Upper Aquifer BV is 106 mg/L for sodium. The RDA for sodium is 150 mg/L. The GW RAO is equal to the RDA of 150 mg/L. There is a plume of sodium in the Upper Aquifer defined by the GW RAO of 150 mg/L. The sodium concentration in the groundwater sample collected from Upper Aquifer monitoring well WT116A during the Q8 Interim Groundwater Monitoring Program round was 162 mg/L. The concentration of sodium also exceeded the GW RAO in the groundwater sample collected from WT114A, located east of the Site. The sodium in the Upper Aquifer in the vicinity of monitoring well WT114A is cross gradient of the Site and located adjacent the John Weaver Parkway.

Road salt applied to the adjacent roadway is the likely source of sodium in the Upper Aquifer in vicinity of WT114A. This is consistent with the fact that the highest concentration of chloride in the Q8 Interim Groundwater Monitoring Program round was 597 mg/L in a groundwater sample collected from WT114A.

Figure 4.21 presents the concentration of sodium in groundwater samples collected from Intermediate Aquifer monitoring wells during the Q8 Interim Groundwater Monitoring Program. The BV for sodium in the Intermediate Aquifer is 31.1 mg/L. The RDA for sodium is 150 mg/L. Therefore the GW RAO for sodium in the Intermediate Aquifer is equal to the RDA. The concentration of sodium in Intermediate Aquifer groundwater was less than the GW RAO of 150 mg/L, with a maximum detected concentration of 41.1 mg/L in a groundwater sample collected from monitoring well WT120A, located east of the Site.

Figure 4.22 presents the concentration of sodium in groundwater samples collected from Lower Aquifer monitoring wells. The BV of 70.8 mg/L for the Lower Aquifer is less than the RDA of 150 mg/L. Therefore the GW RAO for sodium in the Lower Aquifer is equal to the RDA. The concentrations of sodium in Lower Aquifer groundwater samples from the Q8 Interim Groundwater Monitoring Program round were less than GW RAO. The concentration of sodium in the samples collected from the Lower Aquifer monitoring wells ranged from 4.40 J mg/L in a groundwater sample collected from monitoring well WTB4, located in the northwest corner of the Site, to 61.2 mg/L in a groundwater sample collected from monitoring well WTB1, also in the northwest corner of the Site.

4.4.5 MANGANESE

Figure 4.23 presents the concentration of manganese in groundwater samples collected from Upper Aquifer monitoring wells during the Q8 Interim Groundwater Monitoring Program round. The Upper Aquifer BV for manganese is 712 µg/L. The BV is less than the Tapwater RSL of 880 µg/L for manganese. Therefore the Tapwater RSL is the appropriate GW RAO. The groundwater sample from WT101A, located in the southeast corner of the Site, was the only Upper Aquifer Q8 Interim Groundwater Monitoring Program result that was greater than the GW RAO for manganese with a concentration of 1,120 µg/L.

Figure 4.24 presents the concentration of manganese in groundwater samples collected from Intermediate Aquifer monitoring wells during the Q8 Interim Groundwater Monitoring Program round. The Intermediate Aquifer BV for manganese is 173 µg/L, which is less than the Tapwater RSL of 880 µg/L for manganese. Therefore the Intermediate Aquifer GW RAO for manganese is 880 µg/L. The highest manganese concentrations was 513 µg/L in a groundwater sample collected from monitoring well WTB3, located in the northwest corner of the Site. All of the Q8 Interim Groundwater Monitoring Program Intermediate Aquifer manganese results were less than the GW RAO, which is typical of previous monitoring events. The concentration and distribution of manganese in the Intermediate Aquifer is not consistent with a source of manganese in the landfill.

Figure 4.25 presents the concentration of manganese in groundwater samples collected from Lower Aquifer monitoring wells during the Q8 Interim Groundwater Monitoring Program round. The concentrations of manganese ranged from 12.0 J µg/L in a groundwater sample collected from monitoring well WT101C, located in the southeast corner of the Site, to 202 µg/L, in a groundwater sample collected from monitoring well WTB4, located on the north east corner of the Site. None of these concentrations exceeded the Tapwater RSL of 880 µg/L for manganese, which is the GW RAO for manganese in the Lower Aquifer. The distribution of manganese in the Lower Aquifer during the Q8 Interim Groundwater Monitoring Program round is similar to previous monitoring events.

4.5 CONCLUSIONS

The following is a summary of the compounds detected during the Q8 Interim Groundwater Monitoring Program round at concentrations that were greater than their respective GW RAO:

	Number of Exceedances of GW RAOs/Number of Samples		
	Upper Aquifer	*Intermediate Aquifer*	*Lower Aquifer*
1,1-DCA	0/14	0/17	0/4
cis-1,2-DCE	0/14	0/17	0/4
Vinyl chloride	0/14	0/17	0/4
Benzene	1/14	0/17	0/4
bis(2-Ethylhexyl)phthalate	0/14	0/17	0/4
Arsenic	0/14	2/17	0/4
Calcium	2/14	0/17	0/4
Sodium	2/14	0/17	0/4
Manganese	1/14	0/17	0/4

The pattern of widespread, low-concentration 1,1-DCA, cis-1,2-DCE, and vinyl chloride detections along the southern Site boundary is consistent with residual contamination undergoing degradation in the absence of ongoing contaminant loading.

There is a benzene plume of limited horizontal and vertical extent in the Upper Aquifer in the vicinity of on-Site monitoring well WT115A. There is limited groundwater impact from the landfill around the perimeter of the landfill.

Bis(2-ethylhexyl)phthalate was detected intermittently in groundwater samples that were widely dispersed, both laterally and vertically, both upgradient and down gradient of the Site and typically at low concentrations. This suggests that bis(2-ethylhexyl)phthalate may not be completely, if at all, attributable to Site activities.

Arsenic is present at concentrations greater than its Primary MCL in groundwater samples collected from two Intermediate Aquifer monitoring wells, one located south of the Site and the other east of the Site.

Several of the groundwater samples collected from Upper Aquifer monitoring wells contained calcium and/or sodium at concentrations that were greater than the GW RAOs. Calcium concentrations greater than the GW RAOs are restricted to groundwater samples collected from monitoring wells located at the Site. The only Upper Aquifer Q8 Interim Groundwater Monitoring Program result that exceeded the GW RAO for manganese is from a groundwater sample collected from a monitoring well (WT101A) located in the southeast corner of the Site. Sodium concentrations exceeded the GW RAO in the groundwater samples collected from on-Site monitoring well WT116A and from monitoring well WT114A, located east of the Site. The sodium in the Upper Aquifer in the vicinity of monitoring well WT114A is cross gradient of the Site and located adjacent the John Weaver Parkway. The source of the sodium (and chloride) in the groundwater samples collected from WT114A is likely related to road salt applied to the adjacent roadway.

Arsenic is the only compound that exceeded its GW RAO in Q8 Interim Monitoring Program groundwater samples collected from Intermediate Aquifer monitoring wells. However, monitoring wells WT106B and WT114C are Phase II monitoring wells and the Q8 Interim Groundwater Monitoring Program represents only the second sampling event at these wells. Continued monitoring is required to evaluate the groundwater quality with respect to arsenic in samples collected from these wells.

The analytes in the groundwater samples collected from Lower Aquifer monitoring wells were present at concentrations that were less than the GW RAOs.

5.0 INTERIM GROUNDWATER MONITORING PROGRAM

5.1 INTRODUCTION

The CD includes the following requirements for the groundwater monitoring program:

> *5.1.4 Monitor all groundwater wells associated with Himco Dump for a minimum of 10 years; quarterly monitoring for the first two years. An alternate schedule may be used, if approved by EPA. Based on the results, groundwater-monitoring frequency may be decreased to semiannually for the next three years. At the end of the two year groundwater monitoring period the results will be evaluated by EPA, in consultation with IDEM to determine the on-going sampling frequency and confirm the list of water quality analytes.*

CRA has completed the following routine groundwater quality monitoring rounds at the Site to date:

- Baseline Groundwater Sampling (Q1) - October 28 to November 19, 2008
- Interim Groundwater Monitoring Program (Q2) – February 9 to February 19, 2009
- Interim Groundwater Monitoring Program (Q3) – April 29 to May 6, 2009
- Interim Groundwater Monitoring Program (Q4) – August 4 to August 18, 2009
- Interim Groundwater Monitoring Program (Q5) – November 3 to November 11, 2009
- Interim Groundwater Monitoring Program (Q6) – February 23 to March 4, 2010
- Interim Groundwater Monitoring Program (Q7) – June 15 to June 24, 2010
- Interim Groundwater Monitoring Program (Q8) – September 8 to September 15, 2010

The Phase I Groundwater Investigation report (CRA, 2009) previously provided the results of the Q1 and Q2 sampling events. CRA evaluated the data from the next four quarterly monitoring events, Q3 through Q6, in the Himco Annual Groundwater Monitoring Report (CRA, 2010). CRA also evaluated trends in the groundwater quality data and calculated background concentrations for metals and general chemistry parameters. The Himco Annual Groundwater Monitoring Report (CRA, 2010) includes statistical evaluations of the trends in groundwater quality data based on Q1 through Q6 results. This Phase II Groundwater Investigation report (CRA, October 2010) presents the results of the Q7 round of the Interim Groundwater Monitoring Program, which includes the initial groundwater samples from the Phase II monitoring wells installed in May 2010. Section 4.0 of this report includes an evaluation of the results of the Q8 round of the Interim Groundwater Monitoring Program. Therefore, this section of the report includes a review of the results of the Interim Monitoring Program and CRA's recommendations for future groundwater quality monitoring in the vicinity of the Site.

CRA compared the concentration of organic compounds to primary MCLs, or in the case of 1,1-DCA, the RSL Tapwater value. There were very rare cases when concentrations of the organic compounds exceeded these criteria. Therefore, because of the widespread detection of trace levels of VOCs, CRA also considered the frequency of detection of organic compounds.

CRA's approach to screening organic compounds was different than the approach to screening metals and general chemistry parameters because the former are typically the result of waste disposal activities while the latter can also occur naturally in groundwater. Metals and general chemistry parameters were analyzed in groundwater samples collected from monitoring wells WT102A, WT102B, and WT102C located approximately 1,260 feet north and upgradient of the Site. CRA performed statistical analysis on these data to determine background concentrations to compare with values measured at other locations at the Site. The details of the statistical analysis and the background concentrations were included in Appendix E of the Himco Annual Groundwater Monitoring Report (CRA, 2010). As discussed in Section 4.0, CRA compared the background concentrations for the metals and general chemistry to Primary MCLs, RSL Tapwater, RDAs and Secondary MCLs to determine appropriate GW RAOs.

CRA selected the groundwater quality monitoring parameters for this evaluation based on the frequency of detection and the results of screening against Site-specific GW RAOs are as follows:

Parameter	*Rationale*
1,1-DCE	Detected in more than 20 percent of groundwater samples
cis-1,2-DCA	Detected in more than 20 percent of groundwater samples
Vinyl chloride	Detected in more than 20 percent of groundwater samples
Benzene	Exceeds Primary MCL
bis(2-Ethylhexyl)phthalate	Exceeds Primary MCL
Arsenic	Exceeds Primary MCL
Lead	Exceeds Primary MCL
Iron	Exceeds GW RAO
Calcium	Exceeds GW RAO
Sodium	Exceeds GW RAO
Manganese	Exceeds GW RAO
Sulfate	Exceeds GW RAO

5.2 VOLATILE ORGANIC COMPOUNDS

Since October 2008 and the commencement of routine groundwater sampling at the Site a total of 247 groundwater samples were collected from 40 monitoring wells and analyzed for 48 VOC target analytes. Table 5.1 summarizes the VOCs detected during the Interim Groundwater Monitoring Program. CRA reviewed the frequency of detections of the individual VOCs and screened VOCs results against Primary MCLs. Benzene was the only VOC detected in routine groundwater monitoring samples at concentrations that were greater than its Primary MCL. The most frequently detected VOCs were as follows:

- 1,1-DCA = 31 percent
- Vinyl chloride = 30 percent
- cis-1,2-DCE = 24 percent

5.2.1 BENZENE

As shown in Table 5.1, benzene was detected in 45 of 247 groundwater samples collected from the monitoring well network, or 18 percent of the Interim Groundwater Monitoring Program samples. When it was detected the concentration of benzene ranged from 0.24 J µg/L to 12 µg/L. The concentration of benzene was greater than the Primary MCL of 5 µg/L in 8 of 247 samples collected, or 3.2 percent, all from Upper Aquifer monitoring well WT115A. Figure 4.8 shows the Q8 Interim Groundwater Monitoring Program Upper Aquifer benzene plume and is typical of the routine monitoring data. As shown on Figure 4.8, monitoring well WT115A is located in the southeast corner of the landfill and is within the limit of waste. 73 percent of the Interim Groundwater Monitoring Program samples collected from monitoring well WT115A contained benzene at a concentration greater than 5 µg/L.

Benzene was also detected in routine groundwater monitoring samples collected from seven other monitoring wells, WT101A WT106A, WT111A, WT116A, WT117A, WT117B and WT117C. As shown on Figures 4.8 and 4.9, these monitoring wells are located along the southern limit of waste or, in the case of WT106A, south of the southeast corner of the Site. Six of the wells where benzene was detected are in the Upper Aquifer with WT117B in the Intermediate Aquifer. The groundwater quality data from samples collected from these wells delineate the Upper Aquifer benzene plume. The pattern of widespread, low concentration VOCs along the southern edge of the landfill suggests a relatively weak, local source of benzene somewhere in the vicinity of WT115A.

Benzene was detected in groundwater samples at concentrations that exceed its Primary MCL of 5 μg/L. Therefore, CRA recommends continued routine groundwater monitoring for benzene in the Upper Aquifer in the vicinity of monitoring well WT115A. Section 6.0 includes CRA's recommendations with respect to future routine groundwater monitoring of the on-Site benzene plume in the Upper Aquifer.

5.2.2 VINYL CHLORIDE

As shown in Table 5.1, vinyl chloride was detected in 74 of 247 groundwater samples collected from the monitoring well network during routine groundwater monitoring or 30 percent of the Interim Groundwater Monitoring Program samples. When vinyl chloride was detected, its concentration ranged from 0.22 J μg/L to 2 μg/L.

Figures 4.5, 4.6, and 4.7 show the Q8 Interim Groundwater Monitoring Program Upper, Intermediate and Lower Aquifer vinyl chloride results and is typical of the routine monitoring data. Vinyl chloride was detected in groundwater samples from monitoring wells WT101A, WT101B, WT101E, WT106A, WT106B, WT111A, WT115A, WT116A, WT116B, WT117A, WT117B, WT117C, WT118B, WTB1, WTB4, WTE1, and WTE3, located along the southern Site boundary.

None of these concentrations were greater than the Primary MCL of 2 μg/L for vinyl chloride. Figures 4.5, 4.6, and 4.7 show that 13 of the 17 monitoring wells listed above are located along the southern limit of waste or between the limit of waste and the southern Site boundary. Vinyl chloride was detected in two of eight groundwater samples collected from Upper Aquifer monitoring well WT106A, and both of the groundwater samples collected from Intermediate Aquifer well WT106B, located south of the Site. Vinyl chloride was detected in one of eight samples collected from monitoring well WTB1 and two of eight samples collected from monitoring well WTB4. Both wells are located along the northern Site boundary. Vinyl chloride was not detected (RDL=1.0 μg/L) east of the Site in groundwater samples collected from monitoring wells WT114A, WT114B, WT120A, and WT120B.

The widespread low level vinyl chloride detections in the routine groundwater monitoring samples do not suggest a distinct source with a high concentration VOC plume emanating from the landfill. Vinyl chloride is produced in reducing environments by the degradation of chlorinated organic compounds such as TCE. The distribution of vinyl chloride in groundwater in the vicinity of the Himco Site is more consistent with residual contamination undergoing degradation, with no ongoing source of VOC contaminants.

5.2.3 1,1-DICHLOROETHANE (1,1-DCA)

As summarized in Table 5.1, 1,1-DCA was detected in 76 of 247 groundwater samples, or 31 percent of the Interim Groundwater Monitoring Program samples. There is no MCL for 1,1-DCA. USEPA has requested that the PSDs compare 1,1-DCA results to the calculated Tapwater RSL of 240 μg/L, which is based on an excess cancer risk of 1×10^{-5}. The range of concentrations for the samples where 1,1-DCA was detected range from 0.23 J μg/L to 7.4 μg/L.

1,1-DCA was also detected in Interim Groundwater Monitoring Program samples collected from monitoring wells WT101A, WT101B, WT101D, WT101E, WT111A, WT115A, WT116A, WT117A, WT117B, and WT117C, located along the southern Site boundary, WT106A located south of the Site and WT114B and WT114C, located east of the Site. Figures 4.1 and 4.2 show the Q8 Interim Groundwater Monitoring Program Upper Aquifer and Intermediate Aquifer 1,1-DCA results, respectively, and are typical of the routine monitoring data. There is a pattern of widespread, low-concentration 1,1-DCA detections well below the Tapwater RSL which is consistent with residual contamination undergoing degradation in the absence of ongoing contaminant loading.

5.2.4 CIS-1,2-DICHLOROETHENE (CIS-1,2-DCE)

Cis-1,2-DCE was detected in 59 of 247 groundwater samples, or 24 percent of the Interim Groundwater Monitoring Program samples. The range of concentrations for the samples where cis-1,2-DCE was detected is from 0.21 J μg/L to 2.4 μg/L. None of these concentrations were greater than its Primary MCL of 70 μg/L.

Figures 4.3 and 4.4, show the Q8 Interim Groundwater Monitoring Program Upper Aquifer 1,1-DCA results and is typical of the routine monitoring data. Cis-1,2-DCE was detected in groundwater samples from the following wells WT101A, WT101D, WT101E, WT111A, WT115A, WT116A, WT117A, WT117B, and WT117C, located along the southern Site boundary. Cis-1,2-DCE was not detected (RDL=1.0 μg/L) in groundwater samples collected from WT104A and WT105A, but it was detected in the groundwater sample collected from WT106A, located south of the Site. Cis-1,2-DCE was also detected east of the Site in groundwater samples collected from Intermediate Aquifer monitoring well WT114B, but not Upper Aquifer well WT114A and Intermediate Aquifer WT114C.

The distribution of cis-1,2-DCE is almost identical to the distribution of 1,1-DCA which is consistent with residual contamination undergoing degradation in the absence of ongoing contaminant loading.

5.3 SEMI-VOLATILE ORGANIC COMPOUNDS

CRA has collected a total of 247 groundwater samples from 40 monitoring wells and analyzed them for 65 SVOC target analytes since the Interim Groundwater Monitoring Program began in October 2008. The SVOCs detected in groundwater samples collected from monitoring wells during the Interim Groundwater Monitoring Program are summarized in Table 5.2. CRA reviewed the frequency of detections of the individual SVOCs and screened SVOCs results against Primary MCLs. Bis(2-ethylhexyl)phthalate was the only SVOCs parameter detected at concentrations greater than its Primary MCL (6 μg/L) and it is discussed below.

Bis(2-ethylhexyl)phthalate was detected in 42 of 247 groundwater samples collected during the Interim Groundwater Monitoring Program, or 17 percent of the samples. Figures 4.13 through 4.15 present bis(2-ethylhexyl)phthalate results from the Interim Groundwater Monitoring Program from the Upper, Intermediate and Lower Aquifers and are typical of previous monitoring data. The concentration of bis(2-ethylhexyl)phthalate in the groundwater samples ranged from 0.84 J μg/L to 13 μg/L. Only two of the 42 detections of bis(2-ethylhexyl)phthalate were greater than the Primary MCL of 6 μg/L.

The bis(2-ethylhexyl)phthalate was detected in groundwater samples that are widely dispersed, both laterally and vertically, and typically at low concentrations. This is not the pattern a distinct, high concentration source of SVOCs would create, namely a plume emanating from the landfill. In fact, the presence of bis(2-ethylhexyl)phthalate at relatively large distances both upgradient and down gradient of the Site suggests that the detected values at the Site may not be completely, if at all, attributable to Site activities.

5.4 METALS

CRA has collected a total of 247 groundwater samples from 40 monitoring wells and analyzed them for TAL metals. Tables 5.3 through 5.6 summarize the metals detected in groundwater samples collected during Interim Groundwater Monitoring Program.

The CD states that the GW RAOs are to prevent the use of groundwater that contains Site-related carcinogens and non-carcinogens in excess of MCLs. The CD also states that the GW RAOs must prevent the use of groundwater with Site-related concentrations of calcium, sodium and iron concentrations in excess their upper intake limit or RDAs for sensitive populations.

CRA ranked the criteria as follows:

1. Primary MCLs
2. RSL Tapwater
3. RDA
4. Secondary MCLs

Initially CRA screened the metals data against the Primary MCLs followed by RSL Tapwater, RDA and Secondary MCLs. For example, there is no Primary MCL for iron, so the next level of criteria is the health based RSL Tapwater of 26 mg/L. There is no Primary MCL, RSL Tapwater or RDA for sulfate. Therefore, the best available criterion is the Secondary MCL of 250 mg/L.

CRA analyzed groundwater samples collected from background monitoring wells WT102A, WT102B, and WT102C for metals and general chemistry parameters and completed a statistical analysis of these data to determine background concentrations to compare with values measured at other locations at the Site. Tables 5.3 through 5.5 summarize the BVs for metals parameters for the Upper, Intermediate, and Lower Aquifers. CRA compared the best available criteria to the BVs in order to determine Site related impact and establish appropriate GW RAOs. Several of the BVs exceeded their respective criteria and therefore the BV is the appropriate GW RAO.

Magnesium, nickel, potassium and bromide do not have a Primary MCL, RSL Tapwater, RDA, or a Secondary MCL. Therefore, CRA did not establish a GW RAO for these analytes.

5.4.1 PRIMARY MCLs

Five different metals were detected at concentrations greater than their Primary MCLs during the Interim Groundwater Monitoring Program. They were arsenic, beryllium, chromium, lead, and thallium. The duplicate groundwater samples collected from WT115A in November 2008 contained all exceedances of beryllium and thallium, two of four lead exceedances, two of four chromium exceedances, and two of seven arsenic exceedances. Upper Aquifer monitoring well WT115A is located in the southeast corner of the Site on the perimeter of the waste and approximately 200 feet north of the southern Site boundary. Table 5.6 provides analytical results for metals analysis of groundwater samples collected from Upper Aquifer monitoring well WT115A.

The turbidity of the initial sample collected from WT115A in November 2008 was elevated. Subsequent turbidity results are as follows:

Sample Date	*Sample Turbidity (NTU)*	*Primary MCLs Exceeded*
11/6/2008	190	arsenic, berelium, chromium, lead, thallium (2)
2/12/2009	60.3	lead
5/6/2009	72.9	- -
8/5/2009	79.9	- -
11/6/2009	4.73	- -
3/2/2010	49.4	- -
6/17/2010	171	lead
9/15/2010	206	- -
(2) field duplicate sample		

CRA re-developed the well prior to the November 2009 sampling event. This removed silt from the well screen and sand pack, and reduced the turbidity of the subsequent groundwater samples. Elevated sample turbidity limits the reliability of the metals results from the initial sampling round. Re-development of the well has reduced sample turbidity and the groundwater samples collected subsequently did not contain arsenic, beryllium, chromium, or thallium at concentrations that exceeded their Primary MCLs.

As shown in Table 5.3, the BV values for chromium and thallium are greater than the Primary MCLs and are therefore the appropriate GW RAO. Chromium and thallium concentrations in groundwater samples collected during the Interim Groundwater Monitoring Program were less than the BV and therefore the GW RAO. Chromium exceeded the Primary MCL in two groundwater samples collected from background monitoring well WT102A during rounds Q5 and Q6 of the Interim Groundwater

Monitoring Program. The exceedances are not Site related because they occur in the background well located north (upgradient) of the Site.

CRA does not believe that these rare exceedances of the Primary MCLs for arsenic, beryllium, chromium, and thallium warrant continued routine groundwater quality monitoring.

As shown in Table 5.6, lead concentrations were greater than the Primary MCL in two other samples collected from WT115A and account for the other two of the four lead exceedances during the Interim Groundwater Monitoring Program. Therefore the only exceedances of the Primary MCL for lead during the Interim Groundwater Monitoring Program were restricted to groundwater samples collected from monitoring well WT115A. Section 6.0 includes CRA's recommendations with respect to future routine groundwater monitoring for metals in the vicinity of the Site.

The duplicate groundwater samples collected from WT115A in November 2008 accounts for two of seven arsenic exceedances that occurred during the Interim Groundwater Monitoring program. The other arsenic exceedances occurred in the groundwater sample collected from the following wells:

Well	*Sample Date*	*Arsenic Concentration ($\mu g/L$)*	*Detection Frequency*
WT106A	2/26/2010	38.6	12%
WT106B	6/17/2010	12.2	100%
WT106B	9/9/2010	11.6	100%
WT114C	9/9/2010	20.4	50%
WT120B	6/21/2010	19.7	50%

WT106A and WT106B are located approximately 400 feet south of the southeast corner of the Site. CRA recommends continued groundwater quality monitoring for arsenic to determine if the arsenic concentration in groundwater samples collected from the monitoring well cited above persistently exceed the Primary MCL.

5.4.2 IRON

Tables 5.3, 5.4, and 5.5 provide a comparison of iron results from the Interim Groundwater Monitoring Program to the GW RAOs. The GW RAO for iron was exceeded in 11 of 247 samples, or 4.5 percent, collected during the Interim Groundwater Monitoring Program. All the exceedances occurred in sample collected from Upper

Aquifer monitoring wells WT101A, WT115A, and WT116A, located in the southeast corner of the Site.

Figures 5.1, 5.2, and 5.3 show iron results for groundwater samples collected from the Upper, Intermediate and Lower Aquifers, respectively, during the Interim Groundwater Monitoring Program Q8 round completed in September 2010 and are typical of previous monitoring data. The concentration of iron in groundwater samples collected from Upper Aquifer monitoring well WT101A routinely exceeds the GW RAO. It is also exceeded in three groundwater samples collected from Upper Aquifer monitoring well WT115A, and in once in groundwater samples WT116A, both located along the southern edge of the Site. Iron concentrations in groundwater samples collected from the Intermediate and Lower Aquifer monitoring wells during the Interim Groundwater Monitoring Program were not greater than the GW RAO.

CRA recommends that routine groundwater monitoring for iron in the Upper and Intermediate Aquifers continue in the vicinity of the Site because of routine exceedances of the GW RAOs for iron in groundwater beneath the southeast corner of the Site. Section 6.0 provides the details of the proposed Groundwater Monitoring Program. CRA does not recommend groundwater quality monitoring for iron in the Lower Aquifer because iron concentrations are less than the GW RAO.

5.4.3 <u>CALCIUM</u>

Tables 5.3, 5.4, and 5.5 provide a comparison of calcium results from the Interim Groundwater Monitoring Program to the GW RAOs. The GW RAOs for calcium were exceeded as follows:

	GW RAO (mg/L)	*No. of Exceedances/No. of Samples (percent)*
Upper Aquifer	275	19/110 (17.3%)
Intermediate Aquifer	250	0/97 (0%)
Lower Aquifer	250	0/40 (0%)

Figures 4.17, 4.18, and 4.19 provide calcium results for groundwater samples collected from the Upper, Intermediate and Lower Aquifers, respectively, during the Interim Groundwater Monitoring Program Q8 round completed in September 2010. The Interim Groundwater Monitoring Program Q8 round calcium results are typical of previous monitoring data. The concentrations of calcium in groundwater samples collected from

Upper Aquifer monitoring wells WT116A and WT101A routinely exceed the GW RAO. These wells are located along the southern edge of the Site. The Upper Aquifer GW RAO is also exceeded occasionally in groundwater samples collected from Upper Aquifer monitoring well WT115A, also located along the southern edge of the Site. Calcium concentrations in groundwater samples collected from the Intermediate and Lower Aquifer monitoring wells during the Interim Groundwater Monitoring Program were not greater than the GW RAO.

CRA recommends that routine groundwater quality monitoring in the Upper and Intermediate Aquifers continue in the vicinity of the Site because of routine exceedances of the GW RAOs for calcium in groundwater beneath the Site. CRA does not recommend groundwater quality monitoring for calcium in the Lower Aquifer because calcium concentrations are less than the GW RAO. Section 6.0 provides the details of the proposed Groundwater Monitoring Program.

5.4.4 SODIUM

Tables 5.3, 5.4, and 5.5 provide a comparison of sodium results from the Interim Groundwater Monitoring Program to the GW RAOs. Figures 4.20, 4.21, and 4.22 provide sodium results for groundwater samples collected from the Upper, Intermediate and Lower Aquifers, respectively, during the Interim Groundwater Monitoring Program Q8 round completed in September 2010. The GW RAO was exceeded in samples from only two monitoring wells, both in the Upper Aquifer. The GW RAO for sodium was routinely exceed in groundwater samples collected from Upper Aquifer monitoring well WT116A during the Interim Groundwater Monitoring Program. WT116A is located along the southern Site boundary. The concentration of sodium also occasionally exceeded the GW RAO in the groundwater sample collected from WT114A, located east of the Site. As discussed in Section 4.4.5, the source of the sodium in the Upper Aquifer in the vicinity of monitoring well WT114A is likely road salt applied to the adjacent roadway. This is consistent with the fact the highest concentration of chloride measured during the Interim Groundwater Monitoring Program occurred in groundwater samples collected from WT114A.

CRA recommends that routine groundwater quality monitoring for sodium continue in the Upper and Intermediate Aquifers the vicinity of the Site because of routine exceedances of the GW RAOs for sodium in groundwater samples collected from WT116A. Section 6.0 provides details of the proposed Groundwater Monitoring Program.

5.4.5 MANGANESE

Tables 5.3, 5.4, and 5.5 provide a comparison of manganese results from the Interim Groundwater Monitoring Program to the GW RAOs. The GW RAOs for manganese were exceeded as follows:

	GW RAO ($\mu g/L$)	*No. of Exceedances/No. of Samples (percent)*
Upper Aquifer	880	9/110 (8.2%)
Intermediate Aquifer	880	0/97 (0%)
Lower Aquifer	880	0/40 (0%)

Figures 4.23, 4.24, and 4.25 provide manganese results for groundwater samples collected from the Upper, Intermediate and Lower Aquifers, respectively, during the Interim Groundwater Monitoring Program Q8 round completed in September 2010. September 2010 data are typical of previous monitoring data. The concentration of manganese in groundwater samples collected from Upper Aquifer monitoring well WT101A, located in the southeast corner of the Site, routinely was greater than the GW RAO. Results from groundwater samples collected from WT101A account for eight of the nine samples that had manganese concentrations greater than the GW RAO. It was also exceeded in a groundwater sample collected from Upper Aquifer monitoring well WT106A collected in February 2010. WT106A is located south of the south east corner of the Site. Manganese concentrations were less than the manganese GW RAO in all other Interim Groundwater Monitoring Program samples collected from WT106A.

Section 6.0 provides details of the proposed Groundwater Monitoring Program including ongoing monitoring for manganese.

5.4.6 SULFATE

Tables 5.3, 5.4, and 5.5 provide a comparison of sulfate results from the Interim Groundwater Monitoring Program to the GW RAOs. The GW RAOs for sulfate were exceeded as follows:

	GW RAO (mg/L)	*No. of Exceedances/No. of Samples (percent)*
Upper Aquifer	965	3/110 (2.7%)
Intermediate Aquifer	430	0/97 (0%)
Lower Aquifer	250	0/39 (0%)

Figures 5.4, 5.5, and 5.6 provide sulfate results for groundwater samples collected from the Upper, Intermediate and Lower Aquifers, respectively, during the Interim Groundwater Monitoring Program Q8 round completed in September 2010 and are typical of previous monitoring data. The concentration of sulfate in groundwater samples collected from Upper Aquifer monitoring well WT116A, located in the southeast corner of the Site occasionally exceeds the GW RAO. It was not exceeded in any other Interim Groundwater Monitoring Program samples. Groundwater samples collected from WT116A also routinely have concentrations of calcium greater than the GW RAO. Iron and sodium are also occasionally present at a concentration greater than their GW RAO.

Section 6.0 provides details of the proposed Groundwater Monitoring Program including ongoing monitoring for sulfate.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 GROUNDWATER MONITORING PROGRAM

The SOW allows the frequency of groundwater monitoring to be reduced, with USEPA approval, after 2 years of quarterly monitoring. CRA collected the eighth round of quarterly groundwater samples for the Interim Groundwater Monitoring Program in September 2010. The following section provides a rationalization of the proposed Groundwater Monitoring Program (GMP), including the scope, frequency, and parameters for future groundwater monitoring.

The SOW includes the following requirements for the monitoring well network at the Site:

> 4.3.4 *...sentinel wells for future monitoring of groundwater quality in the buffer zone along the perimeter of the residential area that receives municipal water supply connections.*
>
> 4.3.5 *Install new (sentinel) monitoring wells in the buffer zone, based on the groundwater investigation study performed during the pre-design studies, to monitor groundwater quality in the spatial area where the residents are still using private wells.*
>
> 5.1 *Groundwater Monitoring*
>
> *Performing Settling Defendants will develop and implement a groundwater monitoring program ...Certain locations at which there is groundwater monitoring wells will be selected as points of compliance as approved by EPA, in consultation with IDEM. These wells will be grouped into wells for detection monitoring and wells for compliance monitoring. ...Performing Settling Defendants will submit a ground water monitoring plan as part of the Remedial Design Work Plan, which will address the frequency of sampling, the wells to be sampled, and laboratory analyses to be performed.*
>
> 5.1.2 *Performing Settling Defendants will establish a long-term groundwater monitoring program to monitor the future groundwater conditions from the site monitoring wells approved during the remedial design by EPA, in consultation with IDEM. The purpose is to determine if the groundwater RAOs are being attained. ...A site-specific list of water quality analytes for this groundwater monitoring program will be identified, taking into consideration the results of the baseline sampling round and historic groundwater sampling results.*
>
> 5.1.4 *Monitor all groundwater wells associated with Himco Dump for a minimum of 10 years; quarterly monitoring for the first two years. An alternate schedule may be used, if approved by EPA. Based on the results, groundwater-monitoring frequency may be decreased to semiannually for the next three years. At the end of the two year groundwater monitoring period the results will be evaluated by*

EPA, in consultation with IDEM to determine the on-going sampling frequency and confirm the list of water quality analytes.

Table 6.1 summarizes the monitoring wells included in the Interim Groundwater Monitoring Program and the percentage of groundwater samples collected from each well that contained concentrations of parameters that were greater than their GW RAOs. Based on the results of the Interim Groundwater Monitoring Program, and the summary included in Table 6.1, CRA has developed a GMP that includes wells for detection monitoring and wells for compliance monitoring, as required by Paragraph 5.1 of the SOW. Figures 6.1 and 6.2 show the locations of the GMP detection monitoring wells and compliance monitoring wells in the Upper and Intermediate Aquifers, respectively. Table 6.2 provides a list of the wells included in the GMP, and the rationale for including them in the GMP.

Table 6.3 provides a list of analytical parameters for the GMP. All groundwater samples collected during the GMP will be analyzed for benzene and selected metals and general chemistry parameters. The following sections provide the detailed rationale for the wells and parameters included in the GMP.

Ongoing routine groundwater quality monitoring for SVOCs is not warranted since SVOCs have rarely been detected in groundwater samples collected on or off Site. The most widely detected SVOC is bis(2-ethylhexyl)phthalate, and it was typically detected at low concentrations in groundwater samples that were widely dispersed, both laterally and vertically, across the monitoring area. In fact, the presence of bis(2-ethylhexyl)phthalate at relatively large distances both upgradient and downgradient of the Site suggests that the detected values at the Site are not attributable to Site activities.

The GMP will be semi-annual for 3 years. Monitoring will be completed in the spring and fall of each year. The Phase II monitoring wells have been sampled twice as of September 2010, and the first samples were collected from the Phase III monitoring wells in March 2011. In addition to the GMP, the PSDs will continue the Interim monitoring Program by collecting quarterly groundwater samples for 1 year from the Phase II and the Phase III monitoring wells for analysis of the analytes listed in Table 2.3. CRA will then evaluate the routine monitoring data and recommend appropriate routine groundwater monitoring. In the period between the evaluation of the data and USEPA approval of the proposed monitoring plan CRA will collect groundwater samples from the Phase II and Phase III monitoring wells at a semi-annual frequency and analyze them for the parameters listed in Table 2.3.

In addition to collecting groundwater samples at the wells included in the GMP, the PSDs will measure groundwater elevations semi-annually at the wells listed in Table 6.4.

6.1.1 UPPER AQUIFER MONITORING RATIONALE

The following analytes have been detected during the Interim Groundwater Monitoring Program in groundwater samples from Upper Aquifer monitoring wells at concentrations that exceeded their respective GW RAOs:

- Benzene - GW RAO = 5 µg/L
- Arsenic – GW RAO = 10 µg/L
- Lead - GW RAO = 15 µg/L
- Calcium - GW RAO = 275 mg/L
- Iron - GW RAO = 26,000 µg/L
- Sodium - GW RAO = 150 mg/L
- Manganese - GW RAO = 880 µg/L
- Sulfate - GW RAO = 965 mg/L
- Chloride - GW RAO = 258 mg/L

Benzene

Figure 6.1 illustrates the approximate limit of the benzene plume in the Upper Aquifer. Benzene concentrations in groundwater samples collected from on-Site Upper Aquifer monitoring well WT115A routinely exceeded the Primary MCL, thereby making it the detection monitoring well for benzene. From west to east, monitoring wells WT116A, WT119B, WT122A, WT101A, and WT114A provide horizontal delineation of the Upper Aquifer benzene plume and are therefore the Upper Aquifer benzene compliance monitoring wells. Upper Aquifer monitoring well WT115B, which was installed during the Phase III Groundwater Investigation, will provide vertical delineation of the Upper Aquifer benzene plume.

Arsenic

As shown in Table 6.1, arsenic concentrations in groundwater samples collected from Upper Aquifer on-Site monitoring well WT115A were greater than the GW RAO in 18 percent of the samples. Arsenic concentrations in the groundwater samples collected from Upper Aquifer off-Site monitoring well WT106A were greater than the GW RAO in

13 percent of the samples. Because concentrations were less than the GW RAO in the majority of the samples, WT106A and WT115A will be used for compliance monitoring of arsenic in the Upper Aquifer.

Lead

Similar to arsenic, lead concentrations in groundwater samples collected from Upper Aquifer on-Site monitoring well WT115A were greater than the GW RAO in 36 percent of the samples. Because concentrations were less than the GW RAO in the majority of the samples, WT115A will be a compliance monitoring well for lead in the Upper Aquifer.

Calcium

Figure 6.1 illustrates the limits of the calcium plume in the Upper Aquifer. Groundwater samples collected from on-Site Upper Aquifer monitoring well WT116A routinely contained calcium at concentrations greater than the GW RAO, thereby making it a detection monitoring well for calcium. The majority of groundwater samples collected from monitoring well WT101A also contained calcium at concentrations greater than the GW RAO, so it is an appropriate detection monitoring well for calcium in the Upper Aquifer. Calcium results for groundwater samples collected from monitoring wells WT111A, WT119B, WT122A, WT106A, WT114A, and WT121A provide horizontal delineation of the Upper Aquifer calcium plume. Vertical delineation of the Upper Aquifer calcium plume is based on Intermediate Aquifer groundwater quality, as discussed below.

Iron

Figure 6.1 illustrates the limits of the iron plume in the Upper Aquifer. The distribution of iron in the Upper Aquifer is similar to the distribution of calcium. Iron concentrations in groundwater samples collected from on-Site Upper Aquifer monitoring well WT101A routinely exceeded the GW RAO, thereby making it a detection monitoring well for iron. Groundwater samples collected from on-Site Upper Aquifer monitoring wells WT115A and WT116A contained concentrations of iron that exceeded the GW RAO in 27 percent and 20 percent, respectively, of those samples. Therefore, these wells are suitable compliance monitoring wells for iron in the Upper Aquifer. From west to east, monitoring wells WT111A, WT119B, WT122A, WT106A, WT114A, and WT121A provide horizontal delineation of the Upper Aquifer iron plume and are therefore also Upper Aquifer iron compliance monitoring wells. Vertical delineation of the Upper Aquifer iron plume is based on Intermediate Aquifer groundwater quality results, as discussed below.

Sodium

As shown in Table 6.1, sodium concentrations in groundwater samples collected from on-Site Upper Aquifer monitoring well WT116A were greater than the GW RAO in 60 percent of the samples. Because concentrations exceeded the GW RAO in the majority of the samples, CRA considers WT116A a suitable detection monitoring well for sodium in the Upper Aquifer. From west to east, monitoring wells WT111A, WT119B, WT122A, and WT115B provide horizontal delineation of Site-related sodium in the Upper Aquifer. As discussed in Sections 4.4.4 and 5.4.4, the source of the sodium in the Upper Aquifer in the vicinity of monitoring well WT114A is road salt applied to the adjacent roadway.

Manganese

Figure 6.1 illustrates that the limits of the Upper Aquifer manganese plume are on Site. As shown in Table 6.1, manganese concentrations in groundwater samples collected from Upper Aquifer monitoring well WT101A routinely exceeded the GW RAO. WT101A is located in the southeast corner of the Site, and is also a detection monitoring well for iron and calcium. From west to east, the following monitoring wells provide horizontal delineation of the Upper Aquifer manganese plume and are appropriate manganese compliance monitoring wells: WT115A, WT106A, WT121A, and WT114A.

Sulfate

Figure 6.1 illustrates the limits of the sulfate plume in the Upper Aquifer. The majority of groundwater samples collected from on-Site Upper Aquifer monitoring well WT116A contained sulfate at concentrations greater than the GW RAO, thereby making it a detection monitoring well for sulfate. Sulfate results for groundwater samples collected from monitoring wells WT111A, WT119B, and WT115A provide horizontal delineation of the Upper Aquifer sulfate plume. Vertical delineation of the Upper Aquifer sulfate plume is based on groundwater quality groundwater samples collected from Intermediate Aquifer monitoring well WT116B.

Chloride

Chloride was detected at concentrations greater than the GW RAO in samples collected from Upper Aquifer monitoring wells WT114A and WT116A. The source of the chloride in the Upper Aquifer in the vicinity of monitoring well WT114A is road salt applied to the adjacent John Weaver Parkway, and is not Site-related. Routine groundwater quality monitoring of chloride is included in the proposed GMP.

6.1.2 INTERMEDIATE AQUIFER MONITORING RATIONALE

As shown in Table 6.1, arsenic was the only analyte that was detected during the Interim Groundwater Monitoring Program in groundwater samples from Intermediate Aquifer monitoring wells at concentrations that exceeded its GW RAO.

Intermediate Aquifer monitoring wells WT106B, WT114C, and WT120B were installed during the Phase II Groundwater Investigation and have been sampled twice (June and September 2010). Arsenic was detected at concentrations greater than its Primary MCL in both of the groundwater samples collected from Intermediate Aquifer monitoring well WT106B, located south of the southeast corner of the Site. Arsenic was also detected at concentrations greater than its Primary MCL in one of two samples collected from each of monitoring wells WT114C and WT120B, both located east of the Site. As discussed in Section 6.1, above, the Intermediate Aquifer monitoring wells installed during the Phase II Groundwater Investigation will be sampled at a quarterly frequency for 1 year. The PSDs will then evaluate the frequency and concentration of the arsenic detections to determine if concentrations in excess of the GW RAO persist in the Intermediate Aquifer and further monitoring is warranted.

For the purposes of the GMP, CRA included WT106B, WT114C, and WT120B as detection monitoring wells for arsenic, and will revise this list of wells, as needed, based upon the data from Phase III Groundwater Investigation wells. WT101D, WT101E, WT114B, WT120B, and WT121B act as compliance monitoring wells by defining the horizontal extent of arsenic in the Intermediate Aquifer and providing vertical delineation of compounds that exceed GW RAOs in the Upper Aquifer.

6.1.3 LOWER AQUIFER MONITORING RATIONALE

Based on the data collected to date and the analysis provided in Sections 4.0 and 5.0 of this report, there is no Site-related impact to Lower Aquifer groundwater quality in the vicinity of the Site. Therefore, no Lower Aquifer monitoring wells are included in the GMP.

Phase III Lower Aquifer monitoring well WT106C was installed in March 2011 and sampled in April 2011. The PSDs will collect quarterly groundwater samples from WT106C and the other Phase III monitoring wells and analyze them for the Interim Groundwater Monitoring program analytes for 1 year. CRA will then recommend future monitoring frequency and parameters based on an evaluation of the groundwater quality data. In the period between the evaluation of the data and USEPA approval of the proposed monitoring plan CRA will collect groundwater samples from the Phase III monitoring wells at a semi-annual frequency and analyze them for the parameters listed in Table 2.3.

6.2 GROUNDWATER INVESTIGATION RESULTS

As stated in Section 1.2, the objectives of the groundwater investigations are to:

1. Delineate the horizontal and vertical extent of groundwater impact from the landfill around the perimeter of the landfill
2. Delineate 1,2-dichloropropane detected in a sample from the residential well at 54305 Westwood Drive, immediately east of the Site
3. Delineate an appropriate buffer zone east of the Site
4. Delineate groundwater contaminants that may have migrated south of the Site
5. Provide information required to design an appropriate monitoring well network

The following sections describe how the groundwater investigations completed to date have addressed each of the groundwater investigation objectives cited above, and present the PSDs' plan for future monitoring.

6.2.1 DELINEATION OF GROUNDWATER IMPACT AROUND THE LANDFILL PERIMETER

As described in Section 5.0, the results of the Phase I and Phase II Groundwater Investigations indicate that concentrations of Site-related contaminants greater than the GW RAOs in the Upper Aquifer are restricted to groundwater beneath the Site. Figure 6.1 illustrates the limits of impact to groundwater in excess of GW RAOs for the Upper Aquifer by the most significant contaminants of concern (benzene, sodium, calcium, manganese, and sulfate).

As discussed in Section 5.4.1, arsenic was detected at concentrations greater than the GW RAO of 10 µg/L in groundwater samples collected from the following Intermediate Aquifer monitoring wells located south and east of the Site and installed during the Phase II Groundwater Investigation:

Well	*Date*	*Arsenic Concentration (µg/L)*
WT106B	6/17/2010	12.2
WT106B	9/9/2010	11.6
WT114C	9/9/2010	20.4
WT120B	6/21/2010	19.7

Only two rounds of groundwater samples have been collected from these wells. The PSDs will collect four rounds of quarterly groundwater samples at the Phase II monitoring wells in order to determine if arsenic concentrations greater than the GW RAO in groundwater east and south of the Site are sustained. The PSDs will then evaluate the frequency of monitoring for arsenic.

Site activities have not impacted Lower Aquifer groundwater quality in the vicinity of existing Lower Aquifer monitoring wells. Phase III monitoring well WT106C was installed in March 2011. The PSDs will collect groundwater samples from WT106C and the other Phase III monitoring wells on a quarterly basis for 1 year to evaluate any seasonal variations in groundwater quality data, and then evaluate the frequency of routine groundwater monitoring.

6.2.2 DELINEATION OF 1,2-DICHLOROPROPANE AT 54305 WESTWOOD DRIVE

Three samples collected in 2000 from residential well RW-22 located east of the Site at 54305 Westwood Drive contained between 8 and 10 µg/L of 1,2-dichloropropane, which exceeded the Primary MCL of 5 µg/L. The PSDs collected groundwater samples from existing monitoring wells WT114A and WT114B, located adjacent to 54305 Westwood Drive, on a quarterly basis for 2 years starting in October 2008. 1,2-Dichloropropane was not detected at a concentration greater than 1.0 µg/L in any of these groundwater samples.

The PSDs installed VAS114 adjacent to existing monitoring wells WT114A and WT114B and collected VOC samples to delineate VOC concentrations with depth. The PSDs installed Phase II monitoring well WT114C to investigate peak VOC concentrations measured in VAS114. 1,2-Dichloropropane was not detected in either of the two groundwater samples collected from WT114C during the Q7 and Q8 monitoring rounds.

The data collected during the Interim Groundwater Monitoring Program indicate that 1,2-dichloropropane has not been detected in the vicinity of 54305 Westwood Drive, and the concentrations are therefore no longer in excess of the GW RAO. The PSDs will collect groundwater samples from Phase II monitoring well WT114C at a quarterly frequency for 1 year (until Q10, in March 2011) to confirm the absence of 1,2-dichloropropane in the vicinity of 54305 Westwood Drive. Samples from WT114A and WT114B will also be analyzed for 1,2-dichloropropane until Q10, as summarized in Table 6.3. If 1,2-dichloropropane is not detected in any of these samples, further monitoring for this parameter is not warranted.

6.2.3 DELINEATION OF A BUFFER ZONE EAST OF THE SITE

Based on the data collected to date and the analysis provided in Section 4.0 and Section 5.0 of this report, there is no Site-related impact to Upper Aquifer groundwater quality east of the Site.

As summarized in Section 6.2.1, and described in detail in Section 5.0 of this report, arsenic concentrations were greater than the GW RAO of 10 µg/L in groundwater samples collected from Phase II Intermediate Aquifer monitoring wells WT114C and WT120B, located east of the Site. No other groundwater samples collected from Intermediate Aquifer or Lower Aquifer monitoring wells east of the Site contained analyzed parameters at concentrations greater than the GW RAOs.

6.2.4 DELINEATION OF GROUNDWATER CONTAMINANTS SOUTH OF THE SITE

Based on the data collected to date and the analysis provided in Section 4.0 and Section 5.0 of this report, there is no Site-related impact to Upper Aquifer groundwater quality south of the Site.

As summarized in Section 6.2.1, arsenic was detected on two occasions at concentrations greater than the GW RAO of 10 µg/L in groundwater samples collected from off-Site Intermediate Aquifer monitoring well WT106B, located south of the Site. No other groundwater samples collected from monitoring wells south of the Site contained analyzed parameters at concentrations greater than the GW RAOs, therefore no further delineation of Intermediate Aquifer and Lower Aquifer groundwater quality south of the Site is warranted.

The Phase III monitoring wells were installed in February and March 2011 to investigate hydrogeologic conditions beneath the south east corner of the Site, and south and east of the Site. As discussed in Section 6.3 below, the PSDs will complete one full year of routine quarterly groundwater quality monitoring at the Phase III monitoring wells.

6.3 DATA GAPS

CRA has identified the following data gaps that are yet to be addressed by the Groundwater Investigation:

1. Background values analysis has not been completed
2. Phase II monitoring well sampling has not been completed
3. Phase III monitoring well sampling has not been completed

Six of eight quarterly groundwater samples were collected from the background monitoring well nest (WT102A, WT102B, and WT102C) prior to the land owner (D&J Realty) withdrawing permission for the PSDs to access the wells. If possible, the PSDs will collect two more rounds of samples from the background monitoring wells and then make recommendations with respect to future monitoring of background groundwater quality. These recommendations will be included in the Annual Report to be submitted in November 2011.

The Phase II monitoring wells were installed in May 2010 and the PSDs had collected two rounds of samples from the Phase II monitoring wells as of September 2010. Data collected after September 2010 is not included in this report, and will be included in the Annual Report to be submitted in November 2011. The Phase III monitoring wells were installed in February 2011 and groundwater sampling commenced in March 2011. Quarterly samples will be collected from the Phase II and Phase III monitoring wells until March 2011 and December 2011, respectively. This will provide four rounds of quarterly groundwater quality monitoring at the Phase II and Phase III monitoring wells. The frequency of monitoring will then be reduced to semi-annually. The PSDs will make recommendations with respect future groundwater quality monitoring based on the results of the four quarterly monitoring rounds. Starting in June 2011, or the next routine monitoring period following approval of this report, the samples collected from the Phase II and Phase III monitoring wells will be analyzed for the analytes listed in Table 6.3.

6.4 FUTURE MONITORING AND REPORTING

The proposed GMP will include semi-annual monitoring of the wells listed in Table 6.2 for 3 years. Monitoring rounds will be completed in spring and fall of each year. The samples will be analyzed for the parameters listed in Table 6.3.

Routine hydraulic monitoring will continue at the Site on a semi-annual basis. The wells listed in Table 6.4 will be included in the hydraulic monitoring program.

The PSDs will submit routine annual reports of groundwater quality monitoring at the Site. The next groundwater monitoring report will be submitted to USEPA in November 2011 and will include monitoring data collected from December 2010 through June 2011. This report will include recommendations with respect to future groundwater quality monitoring at the Phase II monitoring wells.

7.0 REFERENCES

Conestoga-Rovers & Associates, November 2008. Remedial Design Work Plan, Himco Site, Elkhart, Indiana.

Conestoga-Rovers & Associates, October 2008. Remedial Design Work Plan- Appendix A Field Sampling Plan, Himco Site, Elkhart, Indiana.

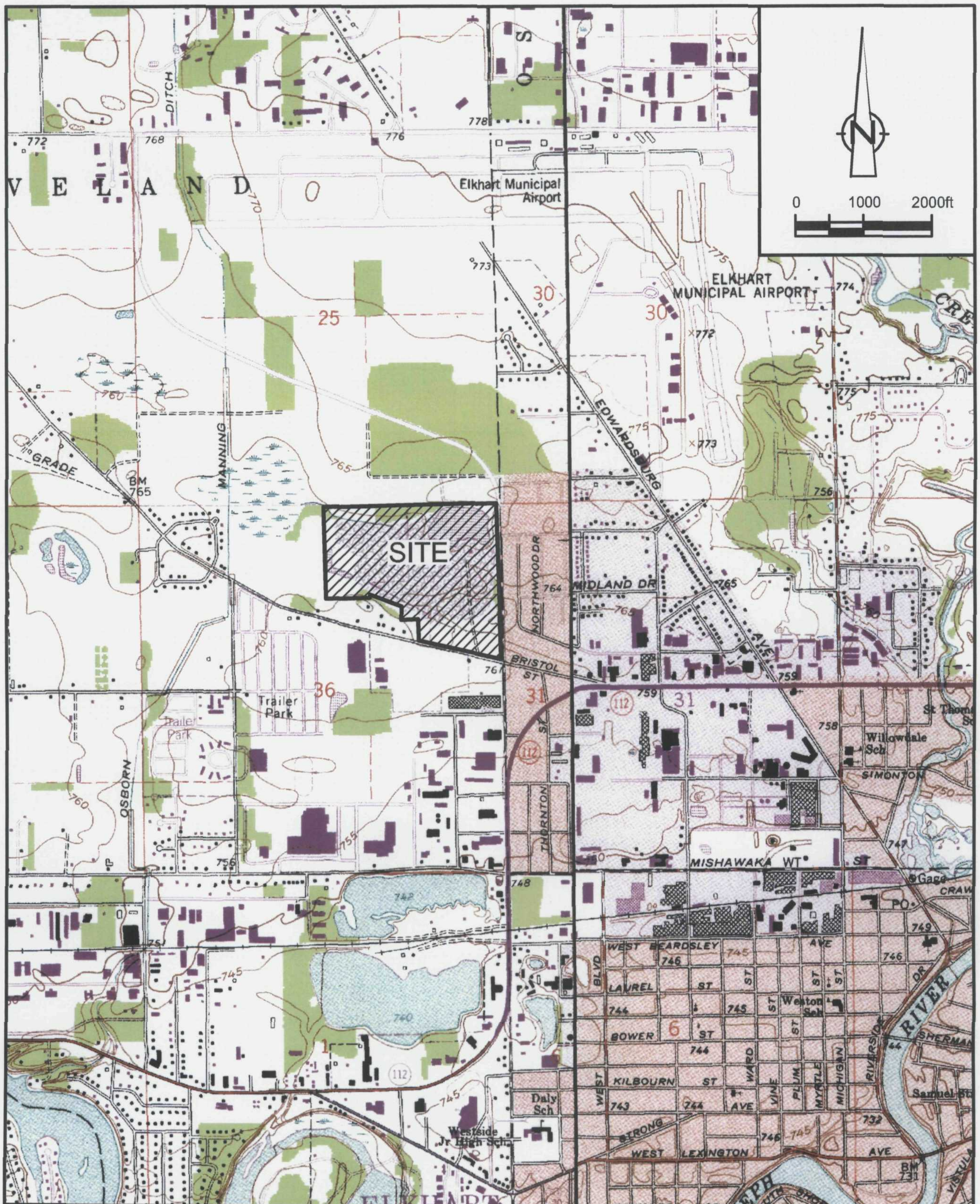
Conestoga-Rovers & Associates, November 2008. Remedial Design Work Plan- Appendix B Quality Assurance Project Plan, Himco Site, Elkhart, Indiana.

Conestoga-Rovers & Associates, May 2009. Phase I Groundwater Investigation, Himco Site, Elkhart, Indiana.

Conestoga-Rovers & Associates, September 2010. Himco Annual Groundwater Monitoring Report, Himco Site, Elkhart, Indiana.

Conestoga-Rovers & Associates, October 2010. Phase II Groundwater Investigation Report, Himco Site, Elkhart, Indiana.

United States Environmental Protection Agency, December 2002. Supplemental Site Investigations/Site Characterization Report, Himco Dump Superfund Site, Elkhart, Indiana.



SOURCE: USGS QUADRANGLE MAPS;
ELKHART AND OSCEOLA, INDIANA

figure 1.1

SITE LOCATION MAP
HIMCO SITE
Elkhart, Indiana

CRA

39611-00(030)GN-WA038 NOV 29/2010

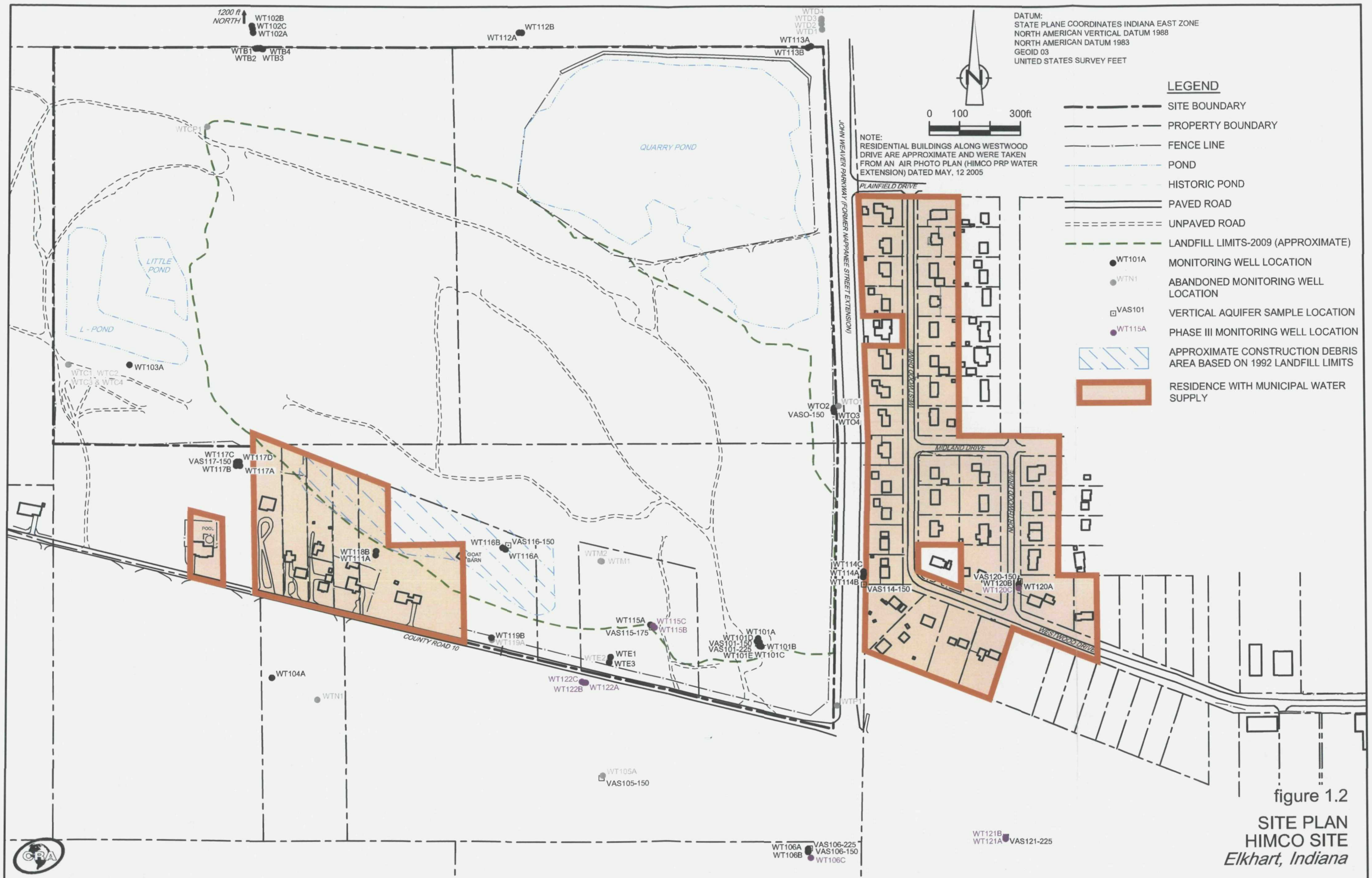


figure 1.2

SITE PLAN
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA029 MAR 24/2011

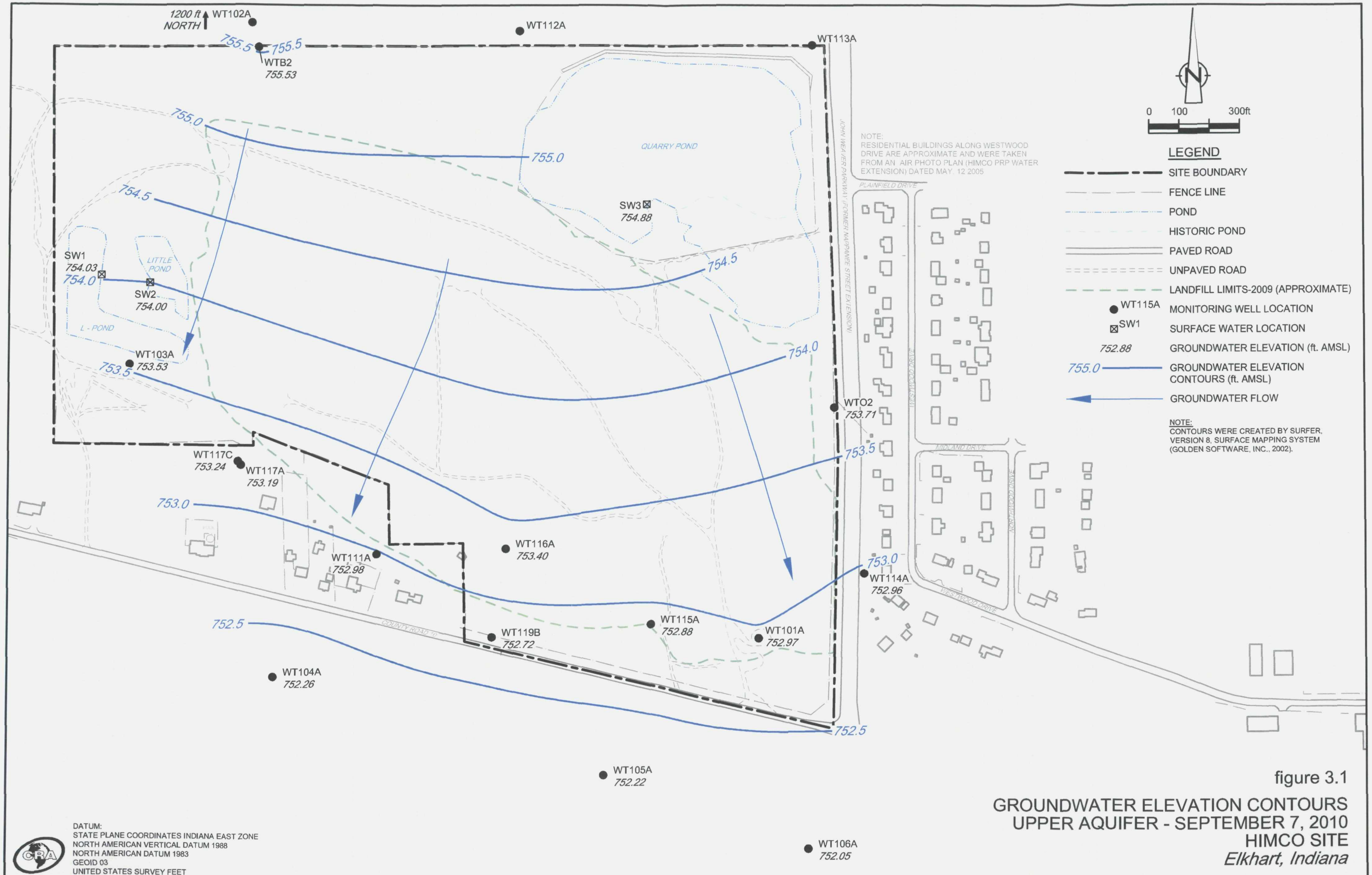
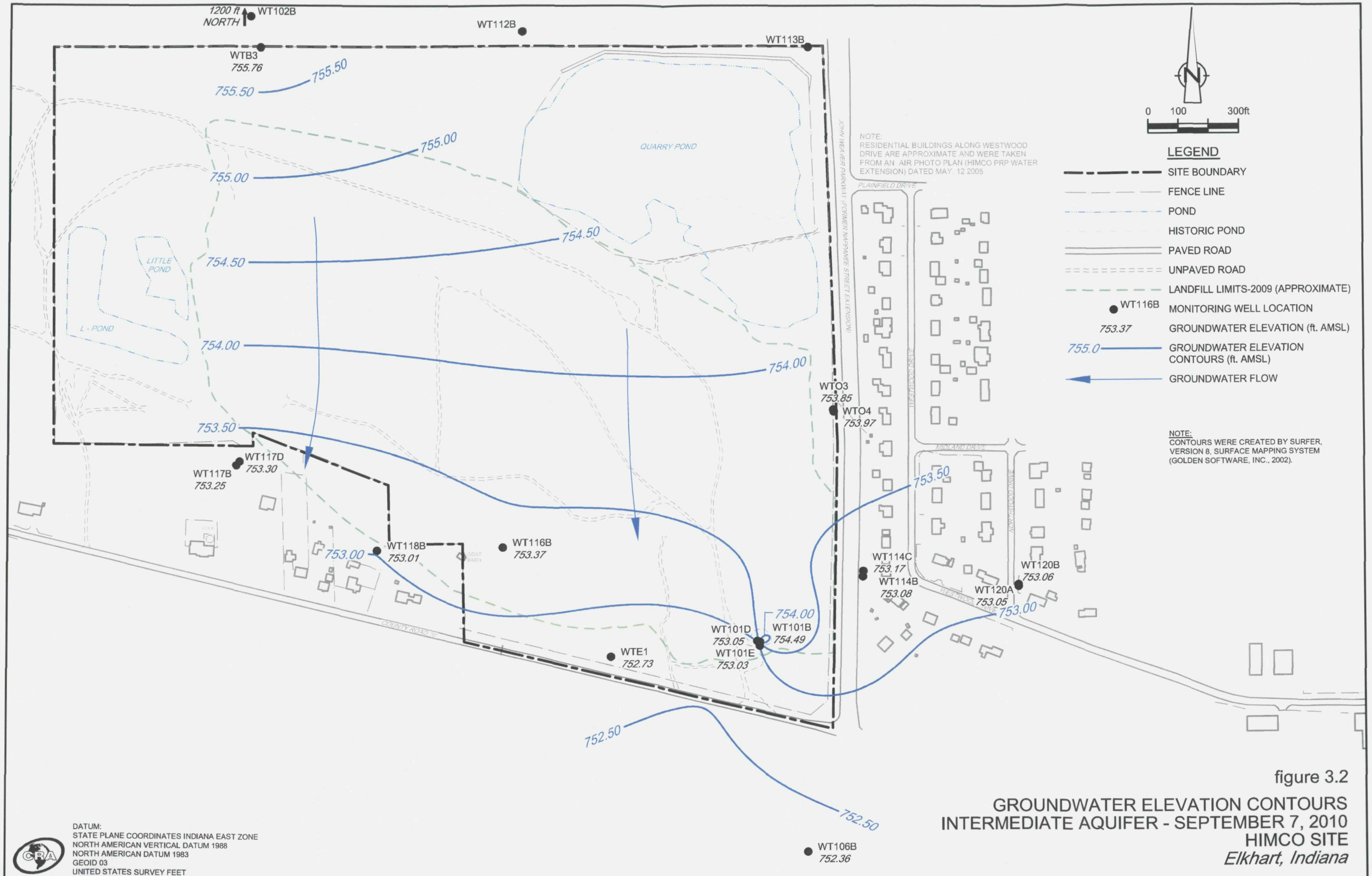


figure 3.1

GROUNDWATER ELEVATION CONTOURS
UPPER AQUIFER - SEPTEMBER 7, 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA001 MAR 24/2011



DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

figure 3.2

GROUNDWATER ELEVATION CONTOURS
INTERMEDIATE AQUIFER - SEPTEMBER 7, 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA002 NOV 29/2010

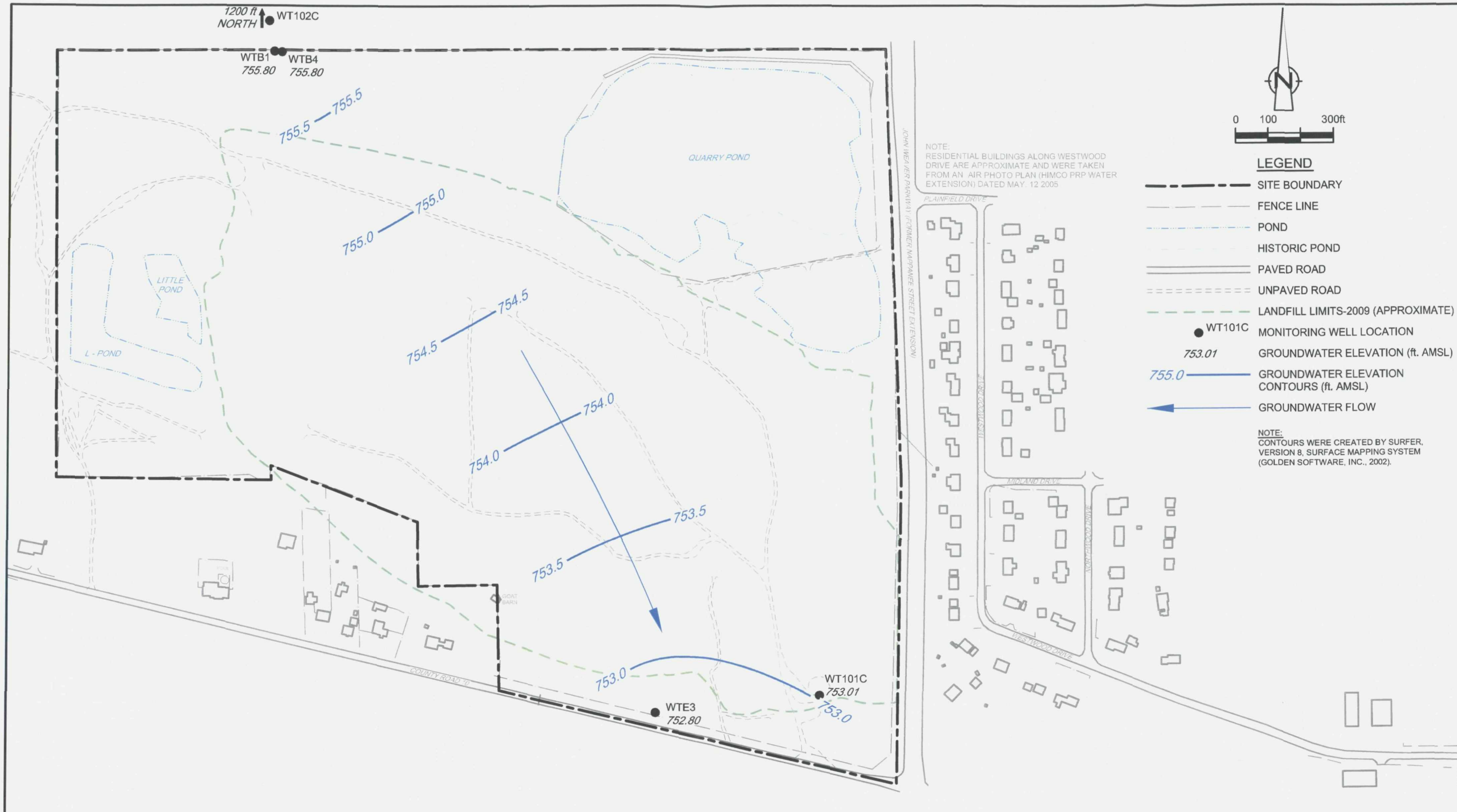


figure 3.3

GROUNDWATER ELEVATION CONTOURS
LOWER AQUIFER - SEPTEMBER 7, 2010
HIMCO SITE
Elkhart, Indiana

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA003 NOV 29/2010

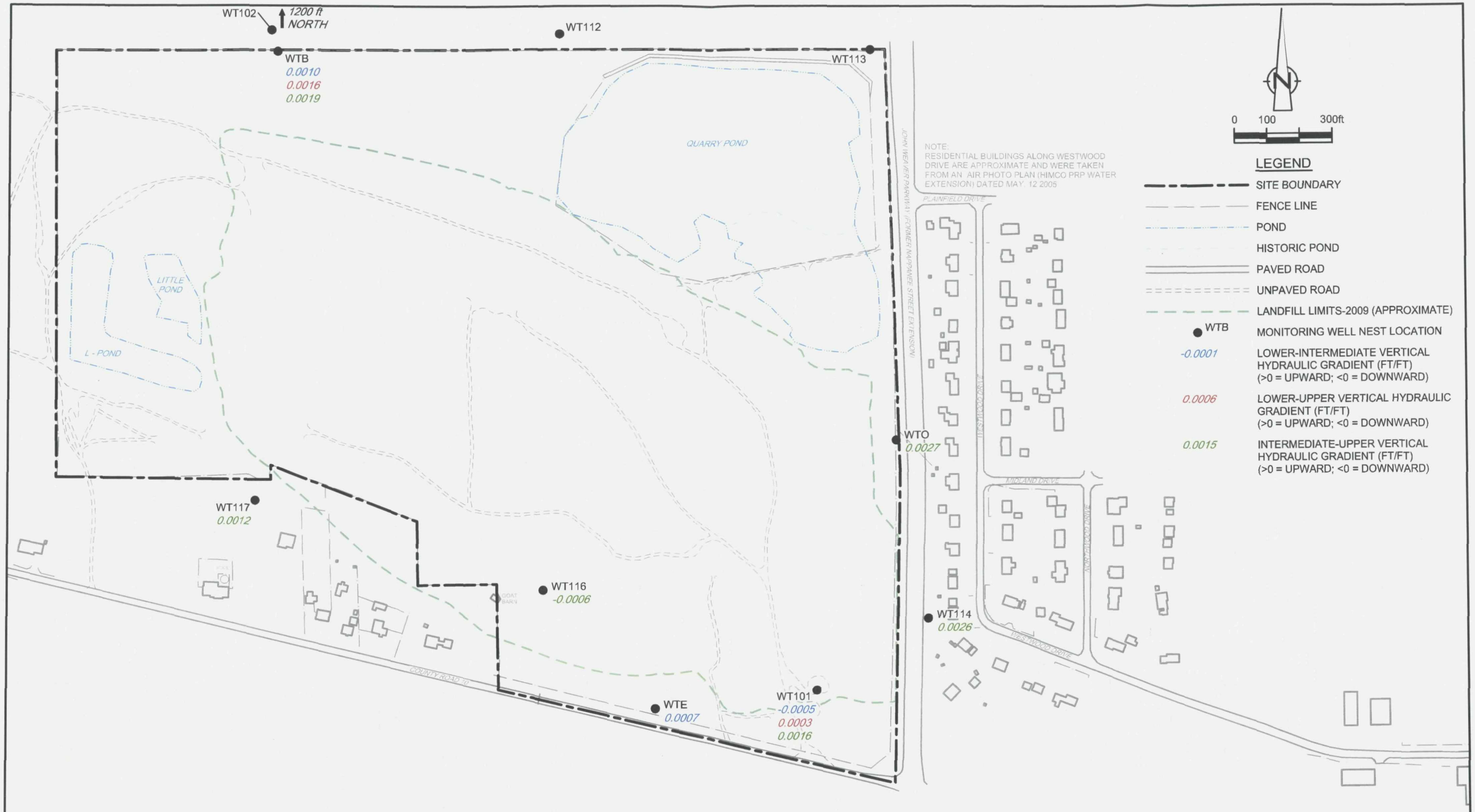


figure 3.4

VERTICAL HYDRAULIC GRADIENT
SEPTEMBER 7, 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA036 NOV 29/2010

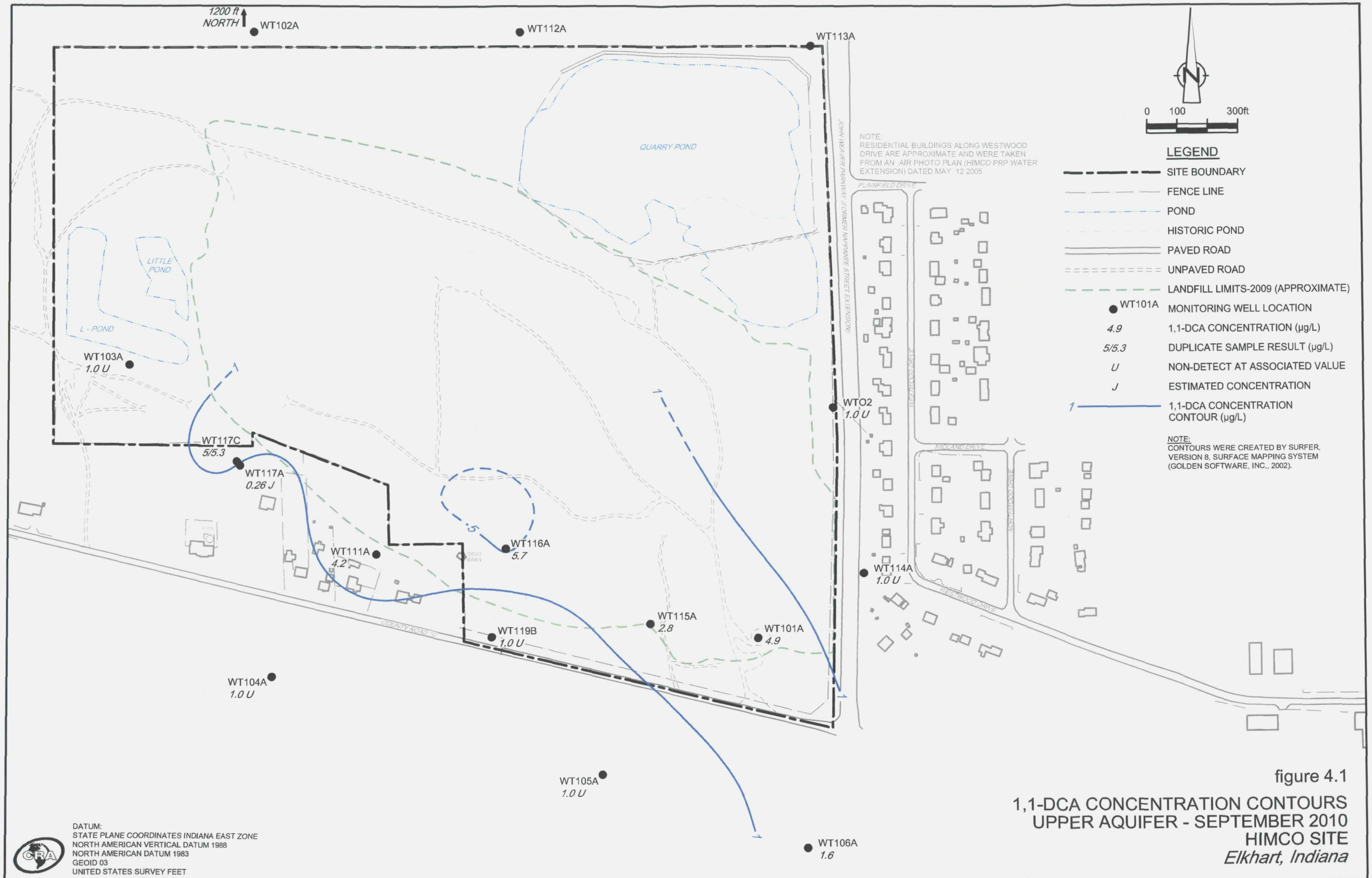


figure 4.1

1,1-DCA CONCENTRATION CONTOURS
UPPER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA027 MAR 24/2011

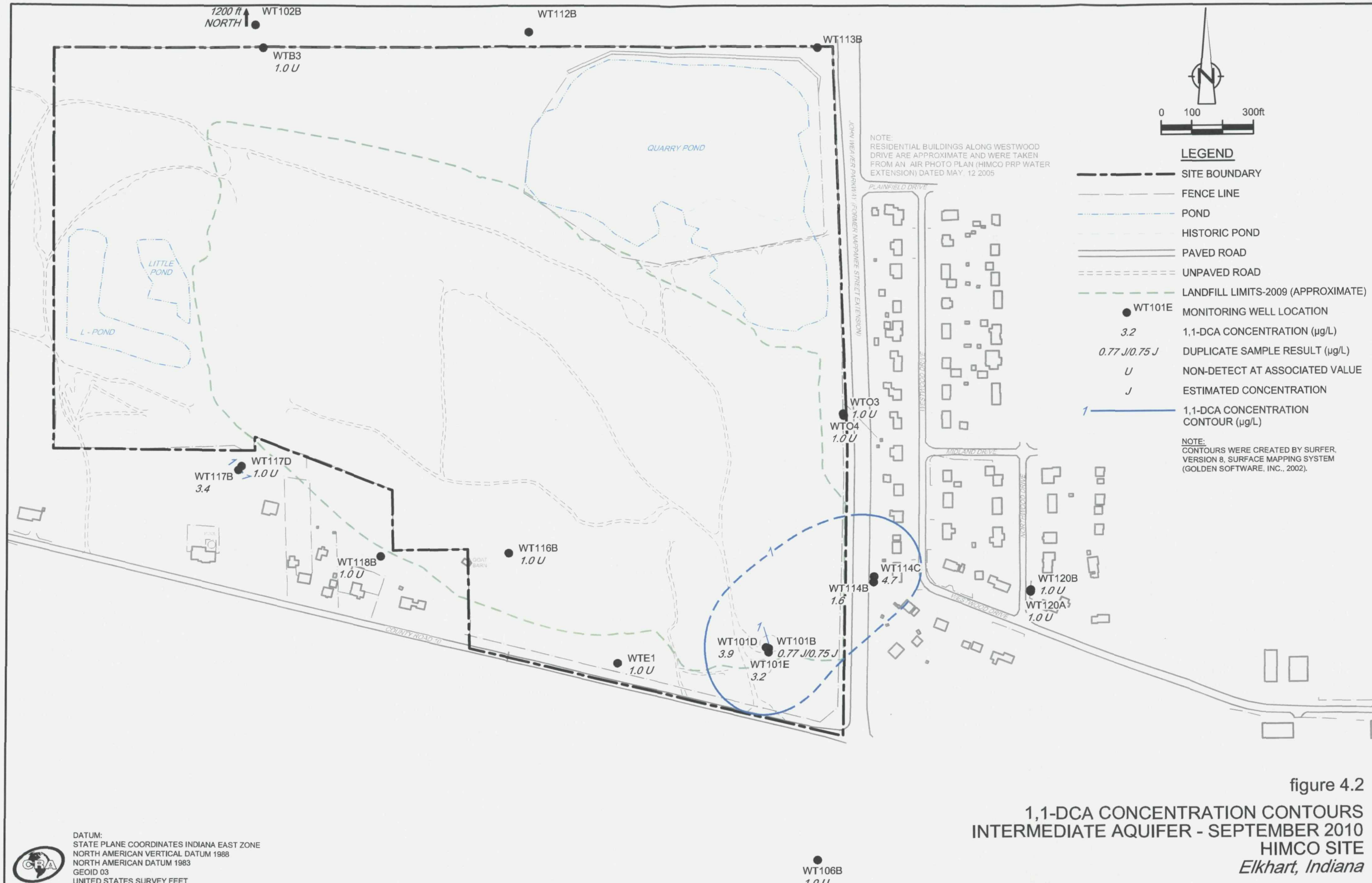


figure 4.2

1,1-DCA CONCENTRATION CONTOURS
INTERMEDIATE AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

CRA

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA028 MAR 24/2011

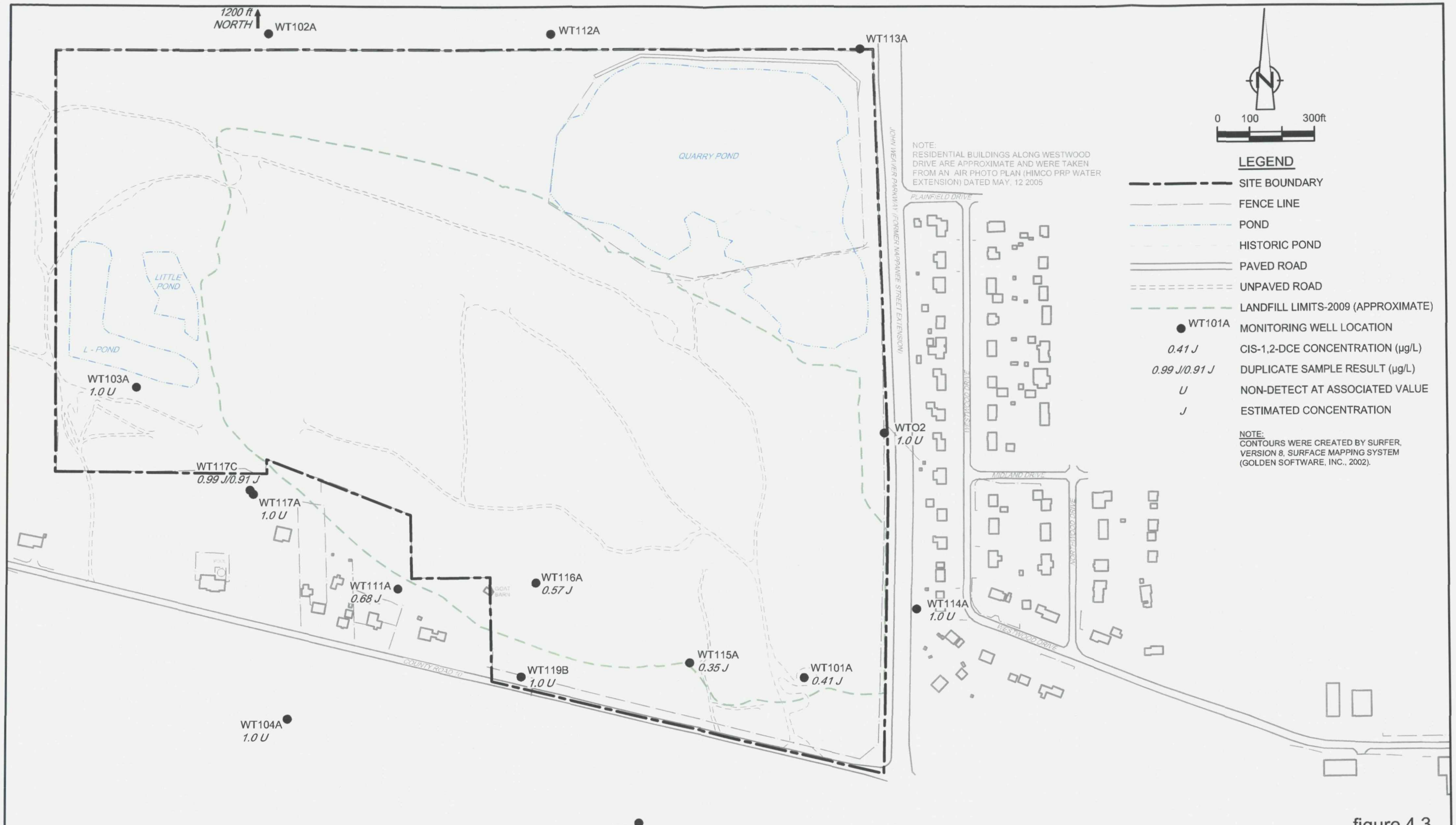


figure 4.3

CIS-1,2-DCE CONCENTRATIONS
UPPER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA030 NOV 29/2010

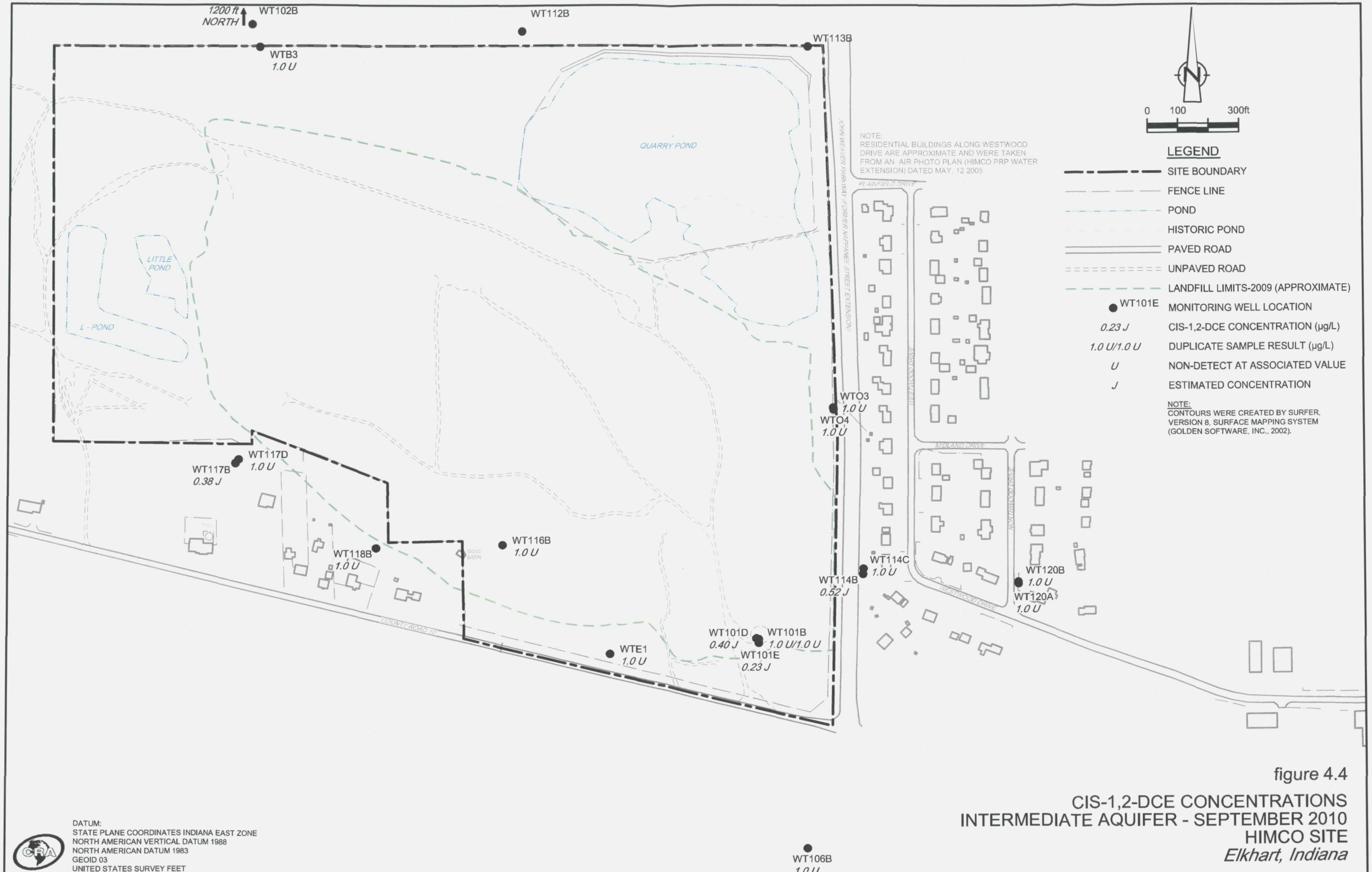


figure 4.4

CIS-1,2-DCE CONCENTRATIONS
INTERMEDIATE AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA031 APR 14/2011

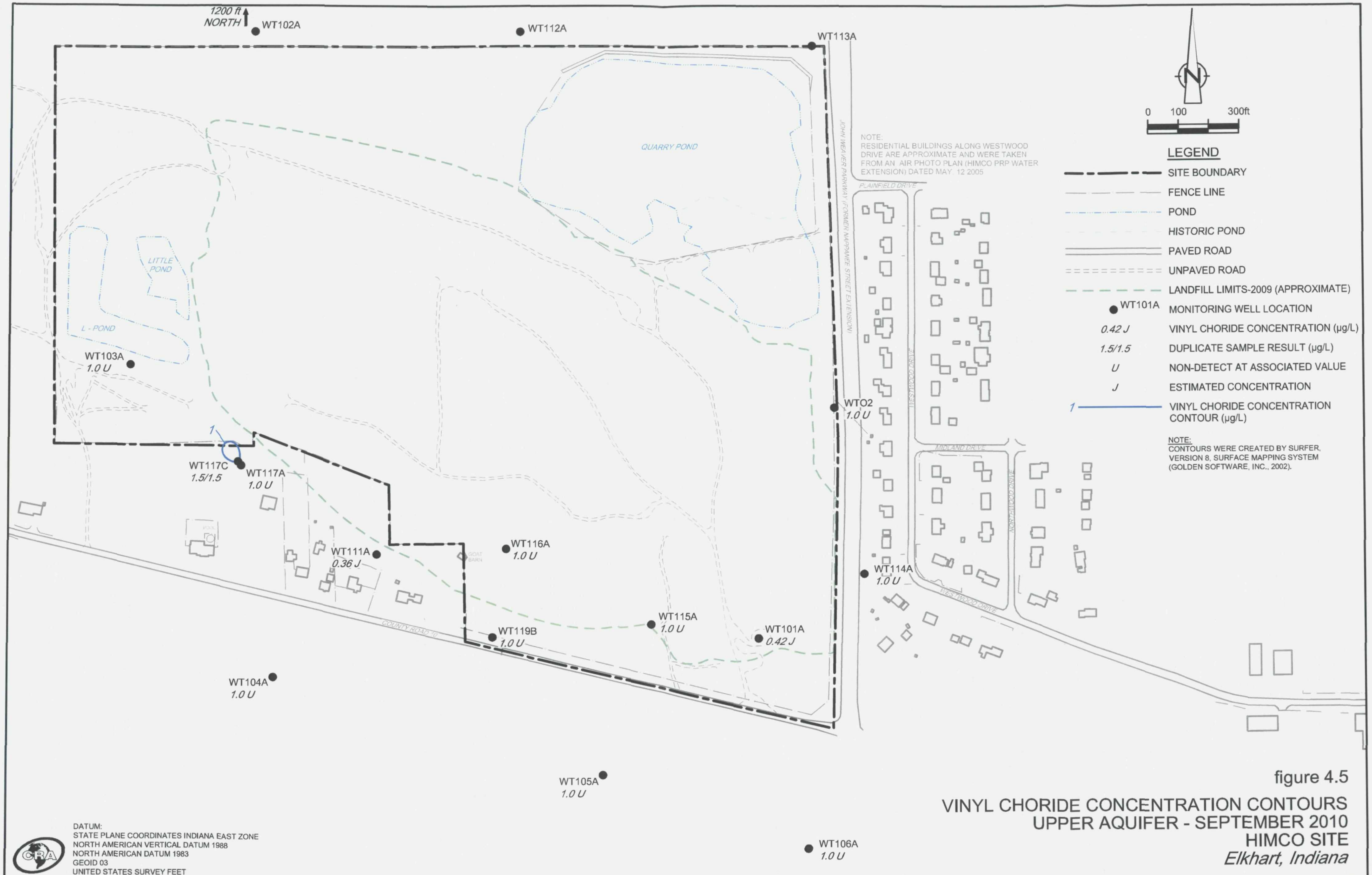


figure 4.5

VINYL CHORIDE CONCENTRATION CONTOURS
UPPER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA004 NOV 29/2010

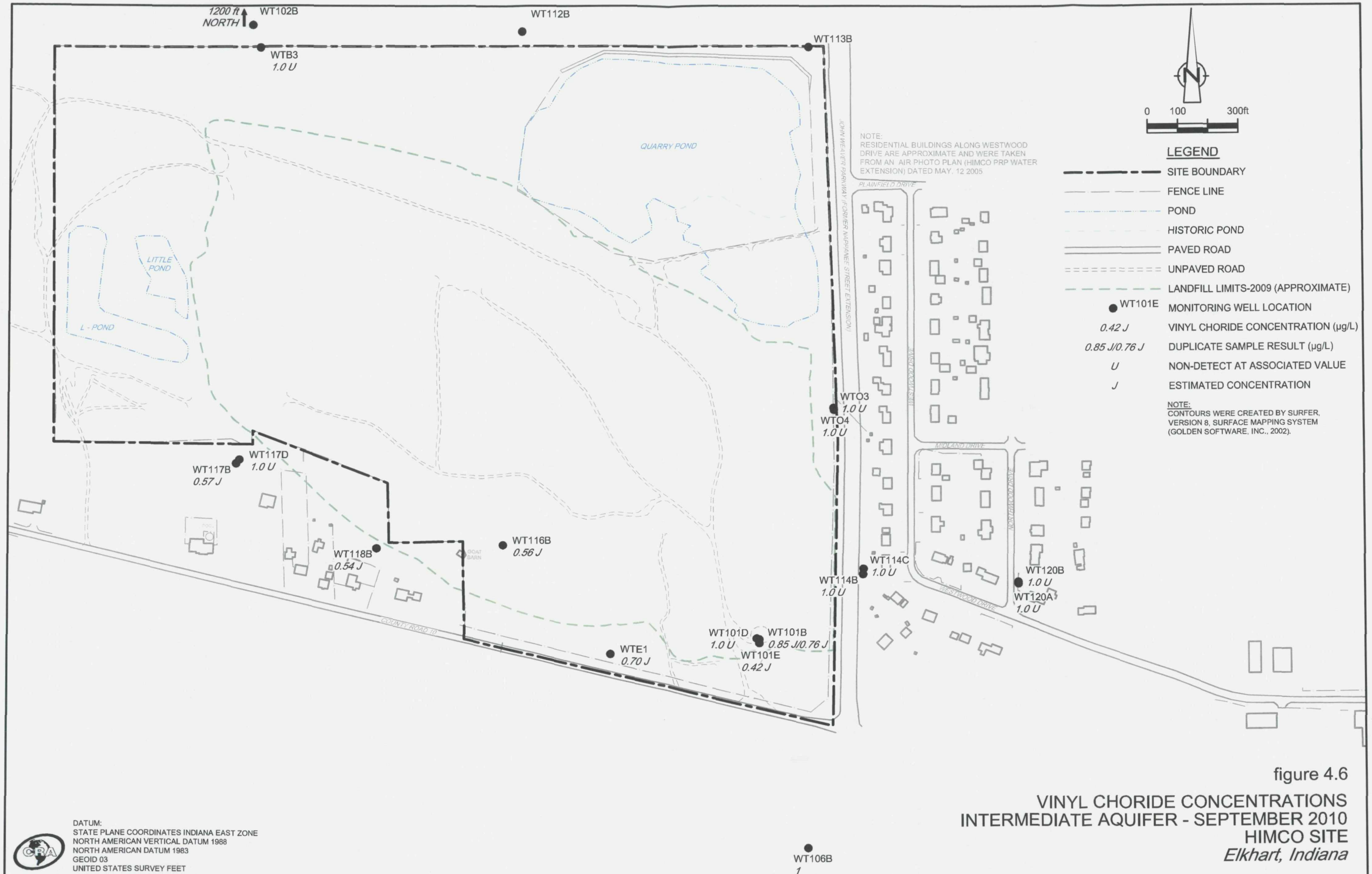


figure 4.6

VINYL CHORIDE CONCENTRATIONS
INTERMEDIATE AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA005 APR 14/2011

figure 4.7

VINYL CHORIDE CONCENTRATIONS
LOWER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA006 NOV 29/2010

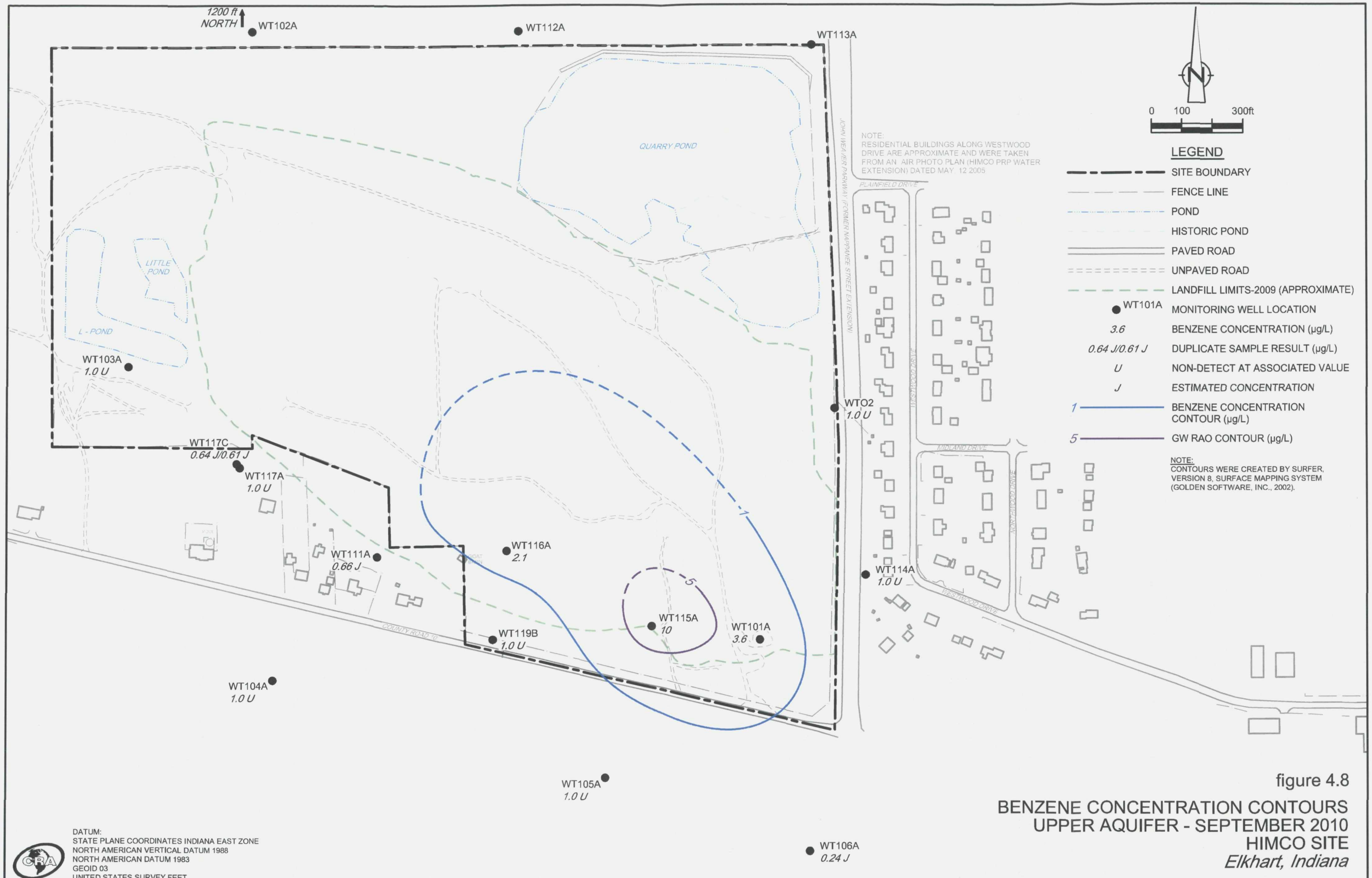


figure 4.8

BENZENE CONCENTRATION CONTOURS
UPPER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA007 MAR 24/2011

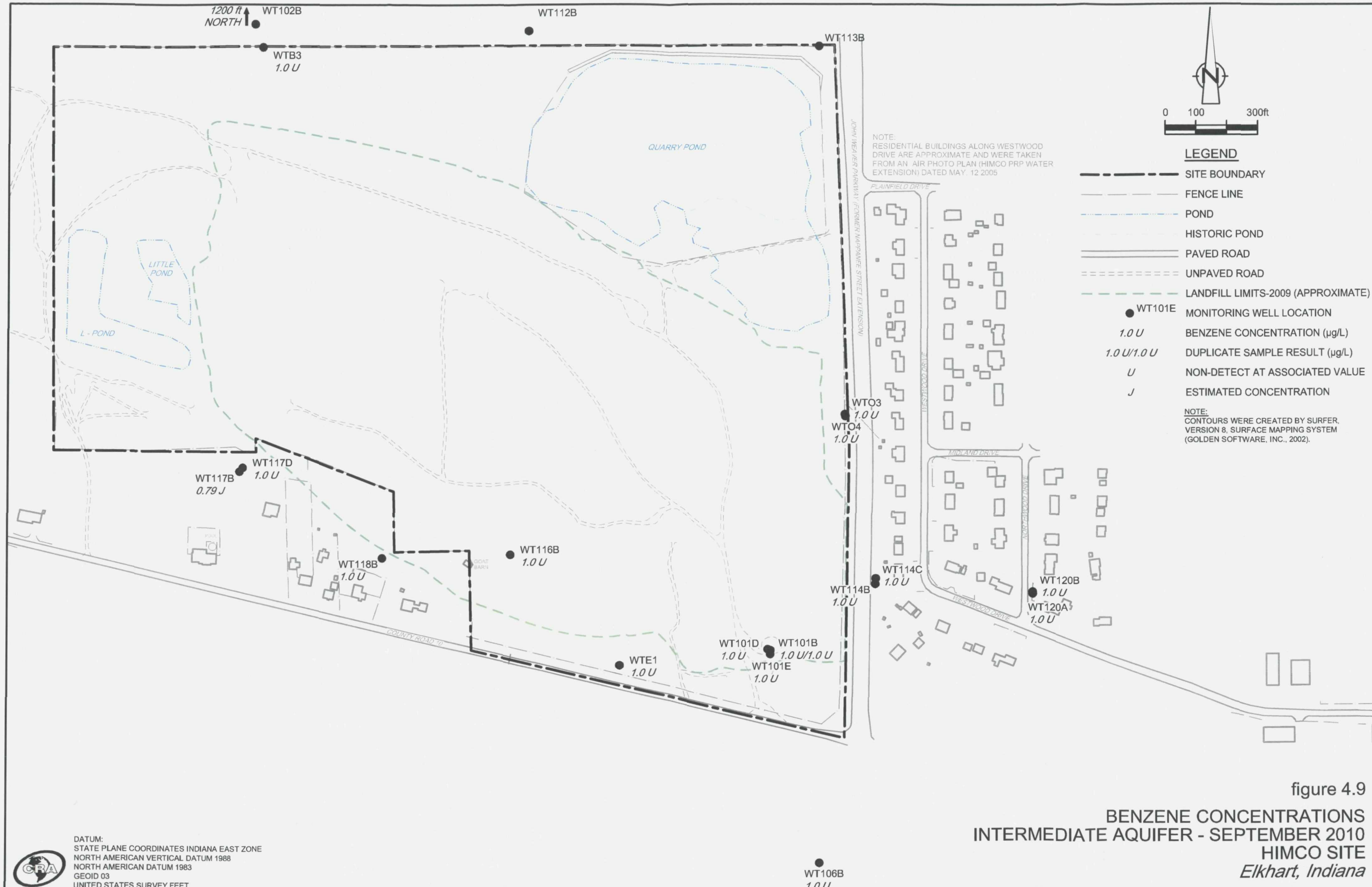


figure 4.9

BENZENE CONCENTRATIONS
INTERMEDIATE AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA008 MAR 24/2011

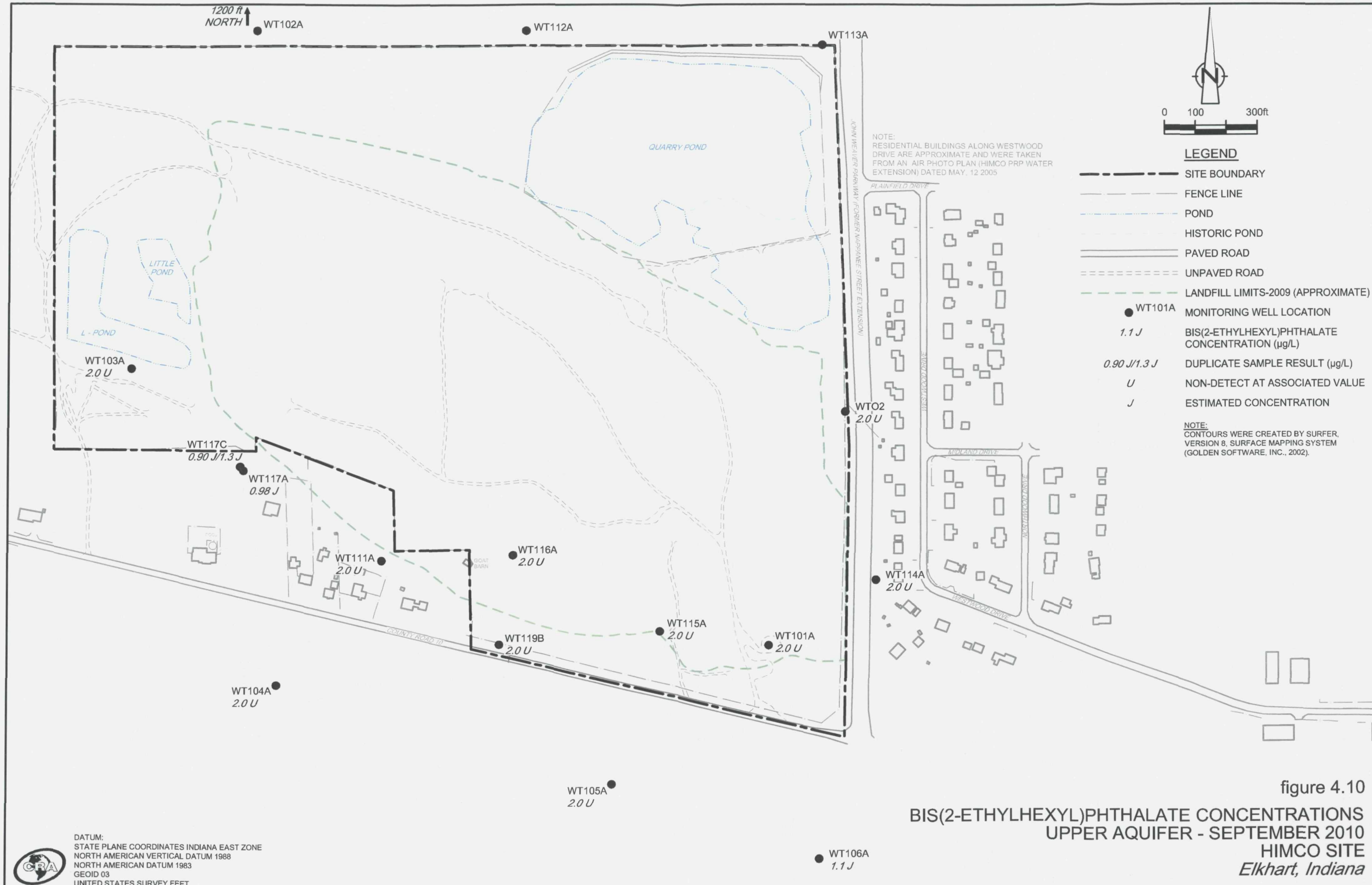


figure 4.10

BIS(2-ETHYLHEXYL)PHTHALATE CONCENTRATIONS
UPPER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA024 APR 14/2011

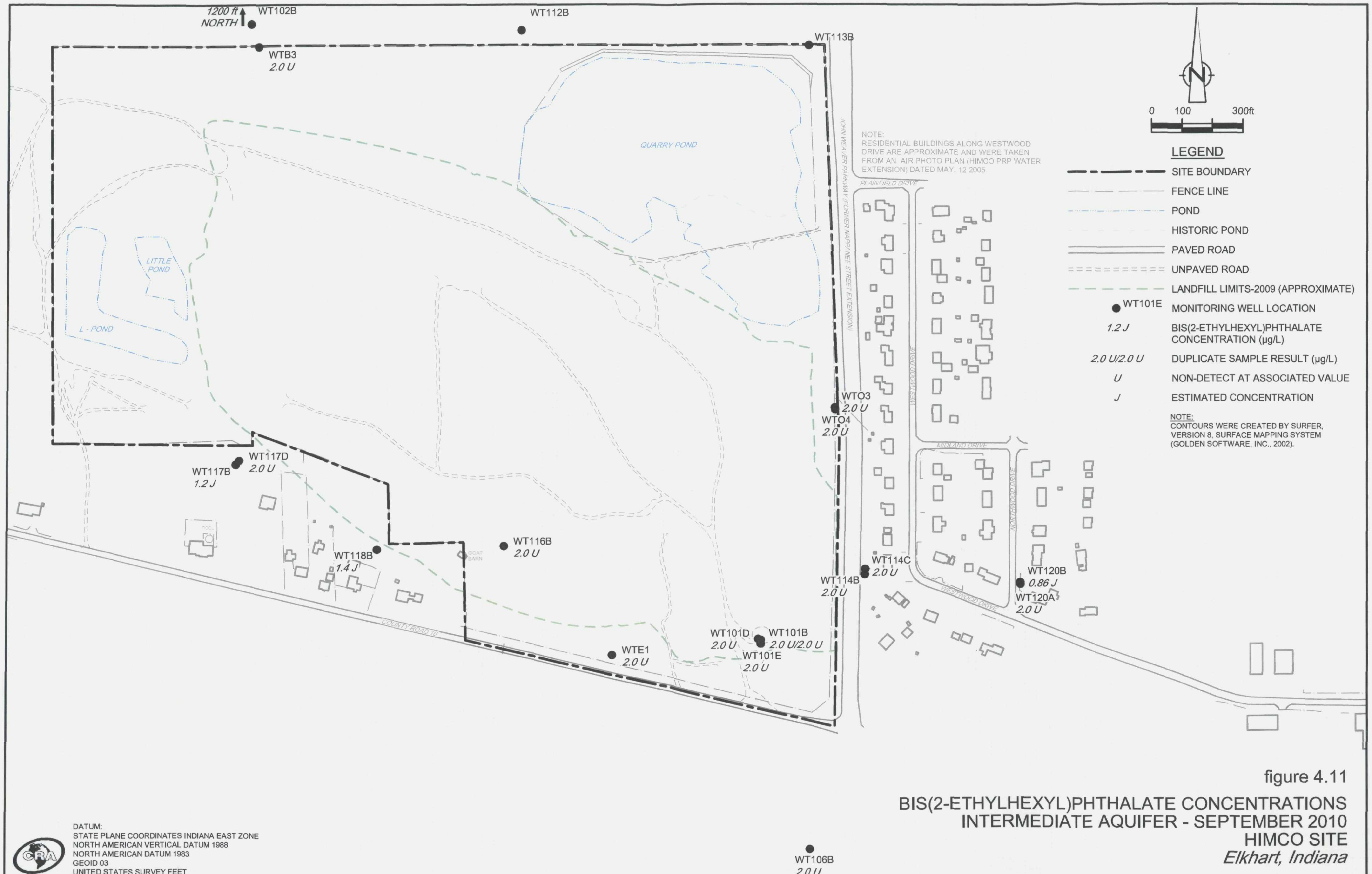


figure 4.11

BIS(2-ETHYLHEXYL)PHTHALATE CONCENTRATIONS
INTERMEDIATE AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA025 APR 14/2011

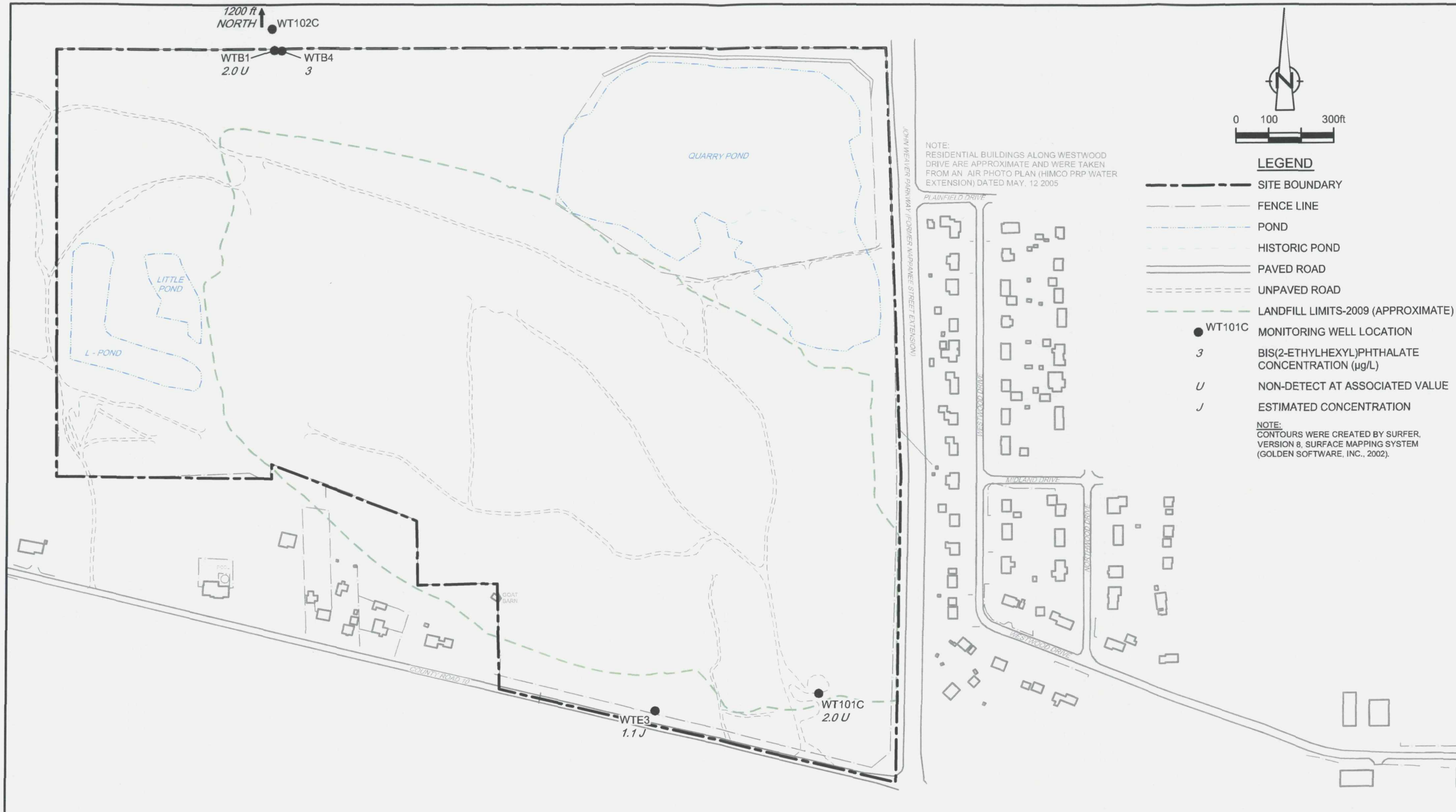


figure 4.12

BIS(2-ETHYLHEXYL)PHTHALATE CONCENTRATIONS
LOWER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

CRA

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA026 APR 14/2011

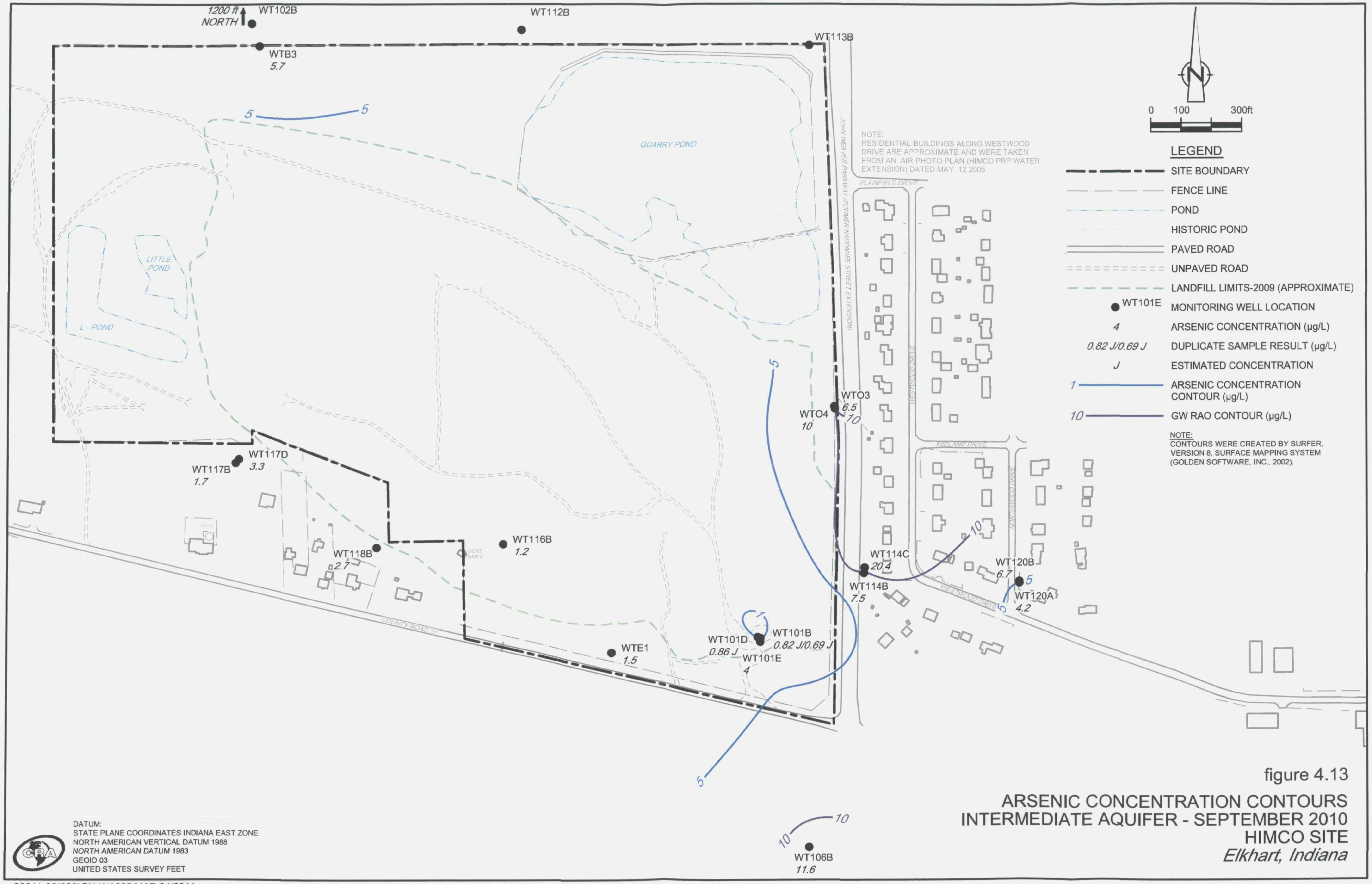


figure 4.13

ARSENIC CONCENTRATION CONTOURS
INTERMEDIATE AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA035 MAR 24/2011

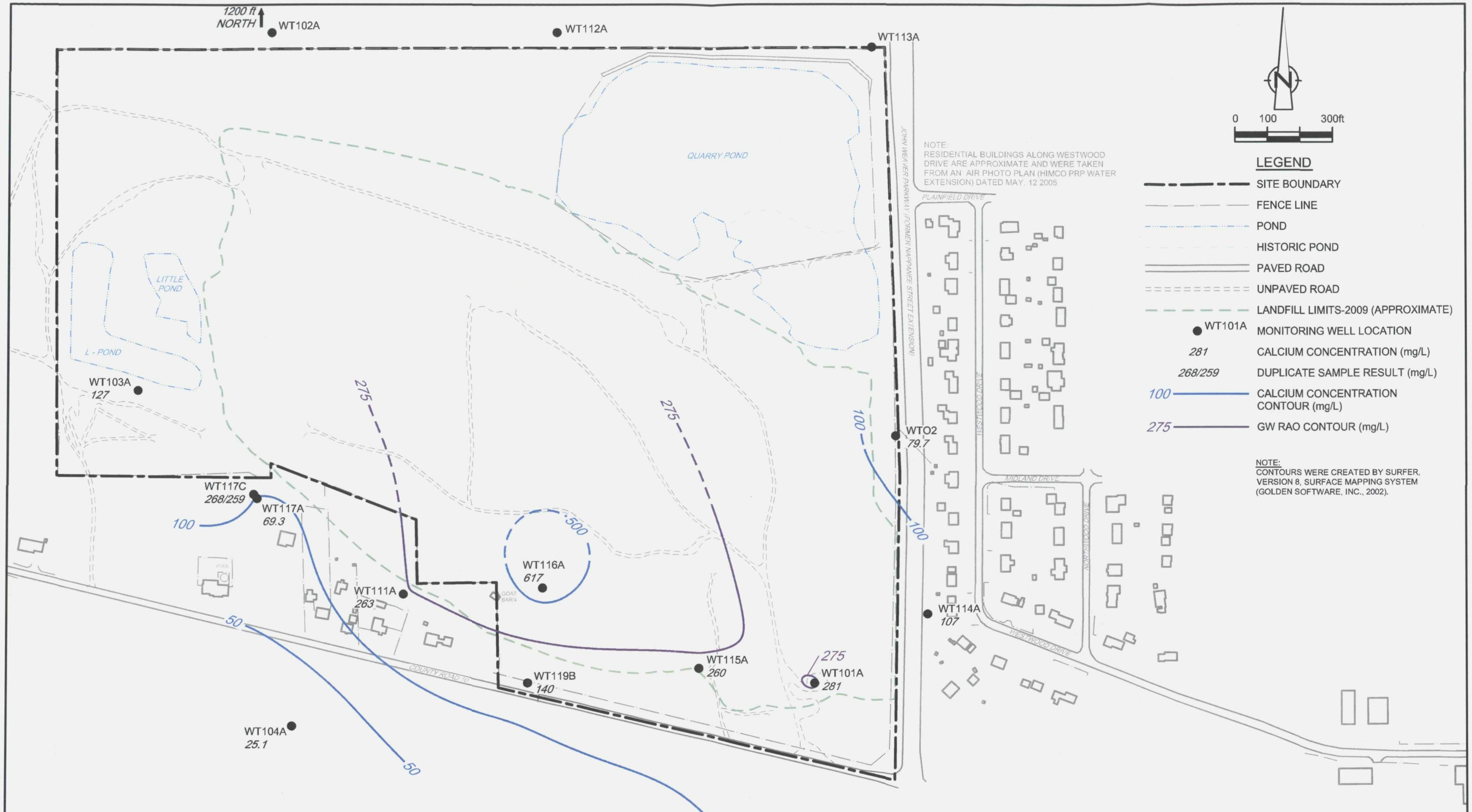
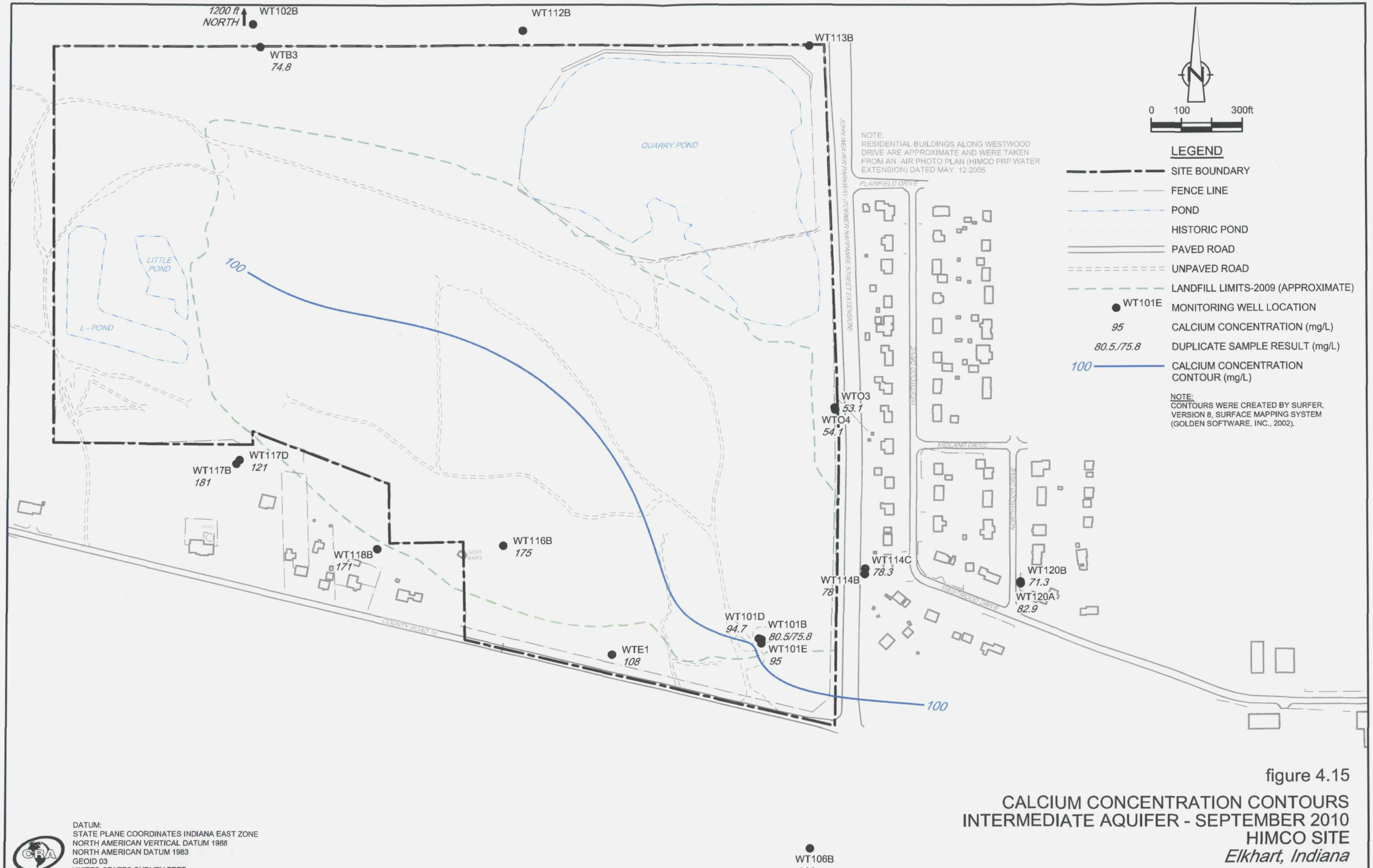


figure 4.14

CALCIUM CONCENTRATION CONTOURS
UPPER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA018 MAR 24/2011



DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

figure 4.15

CALCIUM CONCENTRATION CONTOURS
INTERMEDIATE AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA019 MAR 14/2011

figure 4.16

CALCIUM CONCENTRATIONS
LOWER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA020 MAR 14/2011

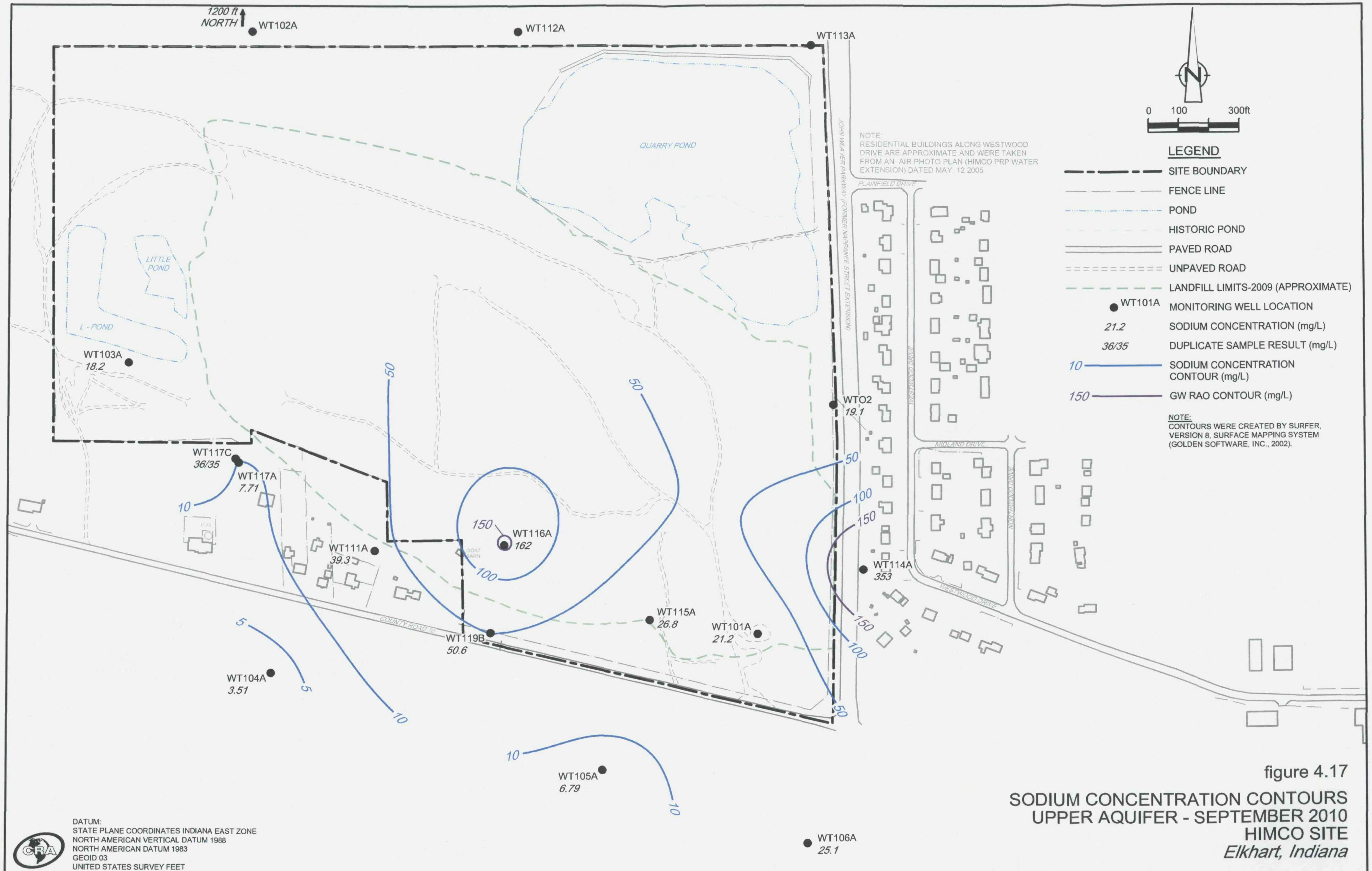


figure 4.17

SODIUM CONCENTRATION CONTOURS
UPPER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA032 MAR 14/2011

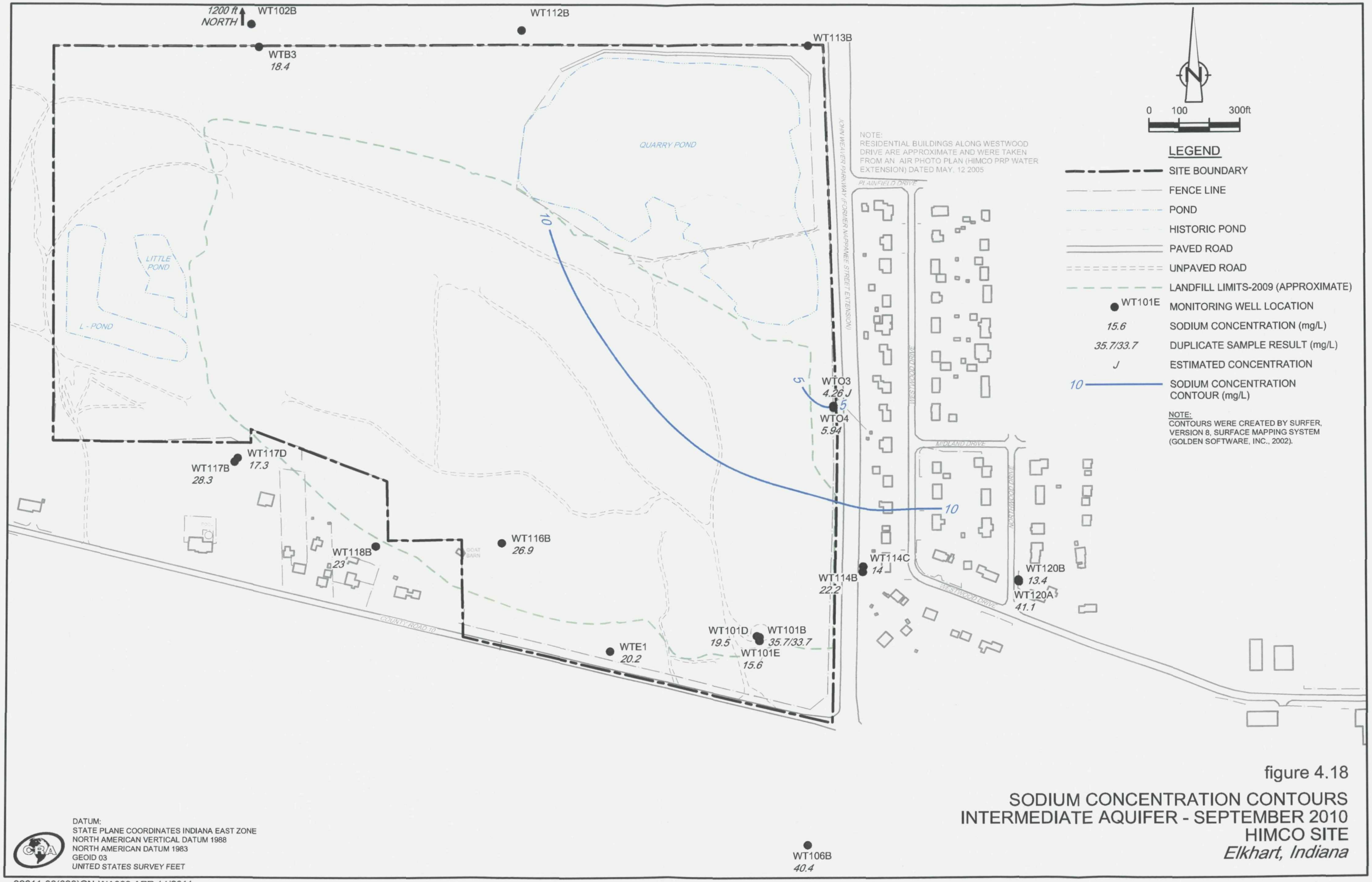


figure 4.18

SODIUM CONCENTRATION CONTOURS
INTERMEDIATE AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA033 APR 14/2011

figure 4.19

SODIUM CONCENTRATION CONTOURS
LOWER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA034 MAR 14/2011

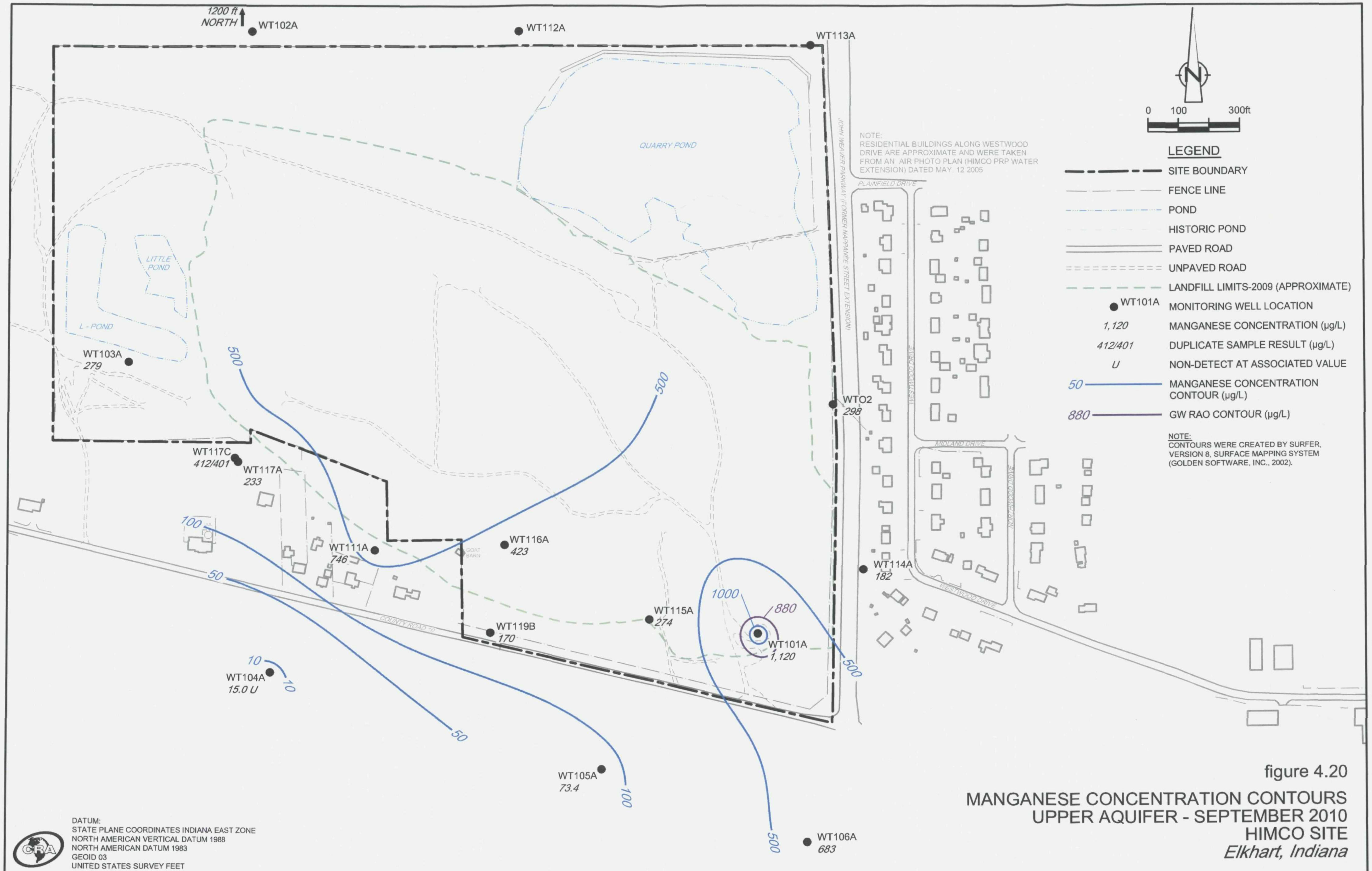


figure 4.20

MANGANESE CONCENTRATION CONTOURS
UPPER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA015 MAR 17/2011

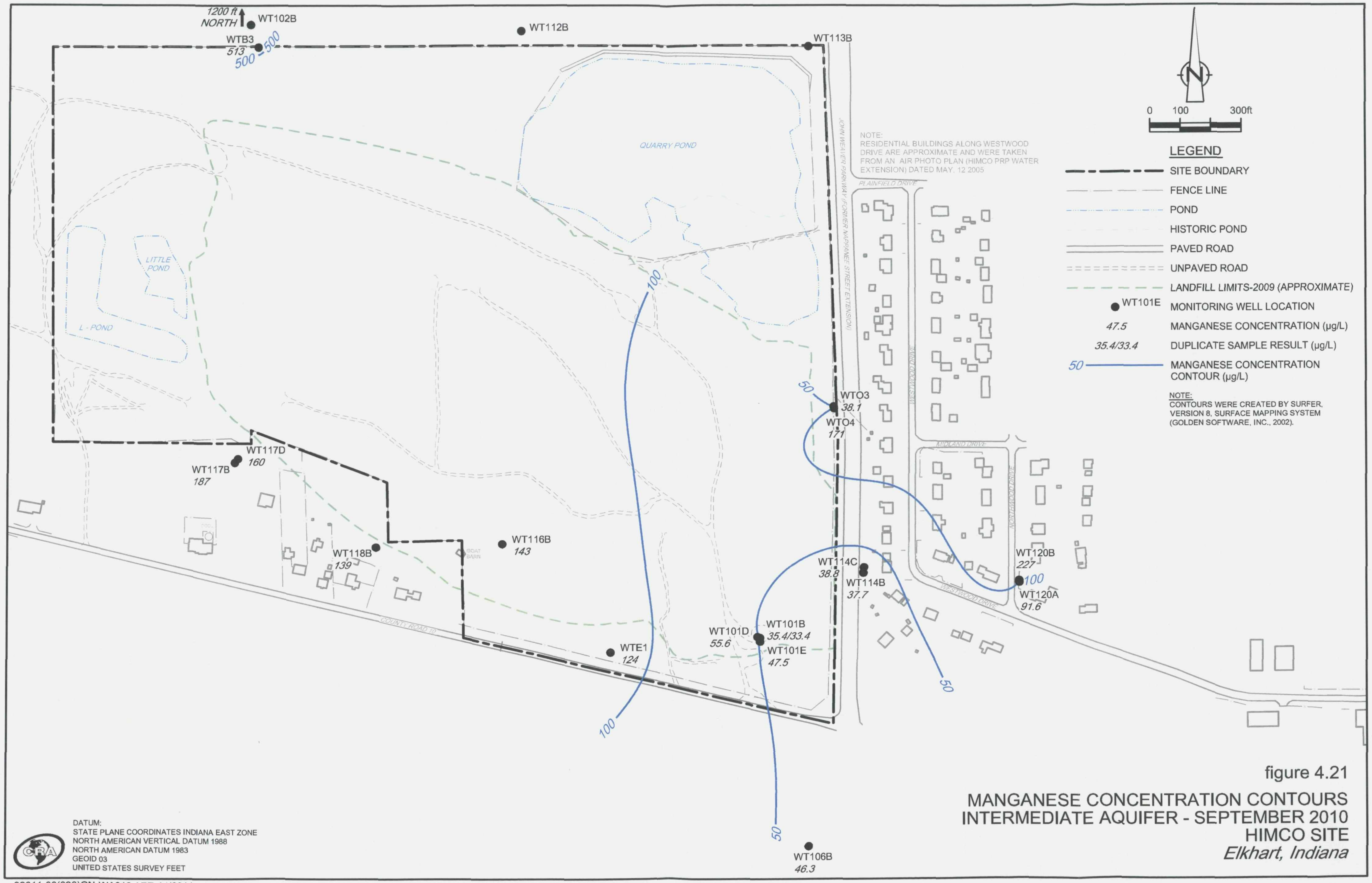


figure 4.21

MANGANESE CONCENTRATION CONTOURS
INTERMEDIATE AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA016 APR 14/2011

figure 4.22

MANGANESE CONCENTRATION CONTOURS
LOWER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA017 MAR 14/2011

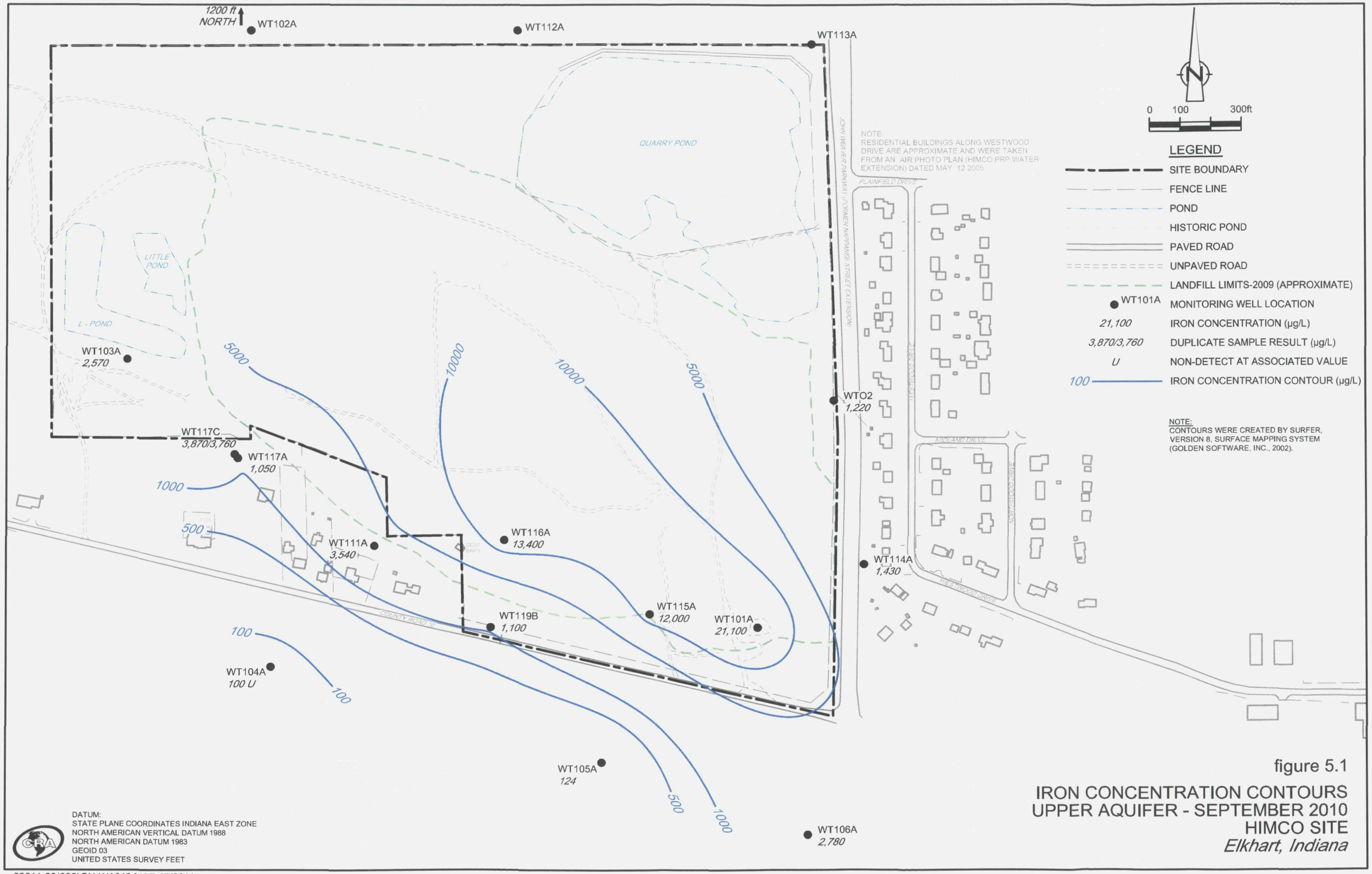


figure 5.1

IRON CONCENTRATION CONTOURS
UPPER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA012 MAR 17/2011

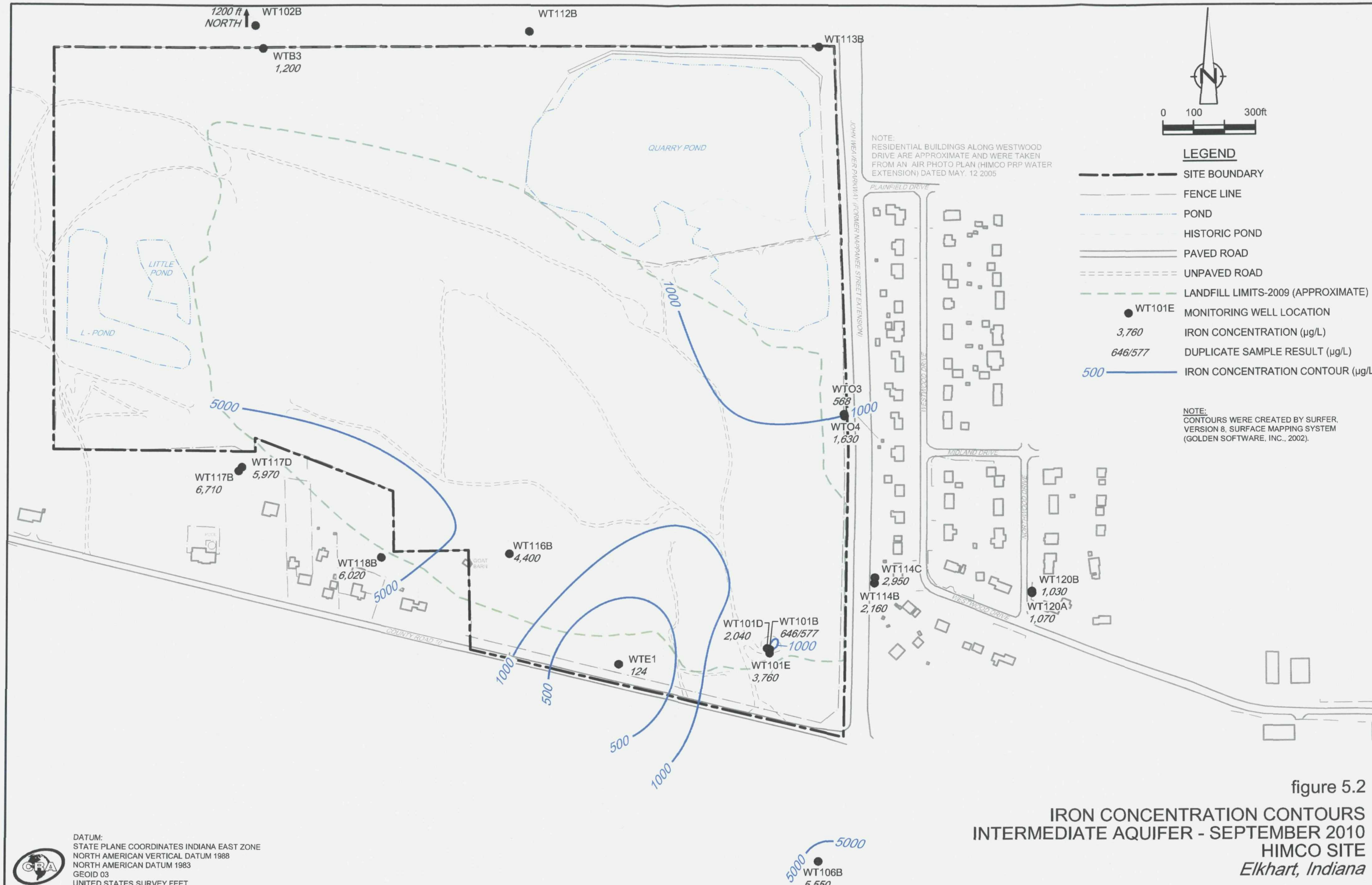


figure 5.2

IRON CONCENTRATION CONTOURS
INTERMEDIATE AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA013 MAR 17/2011

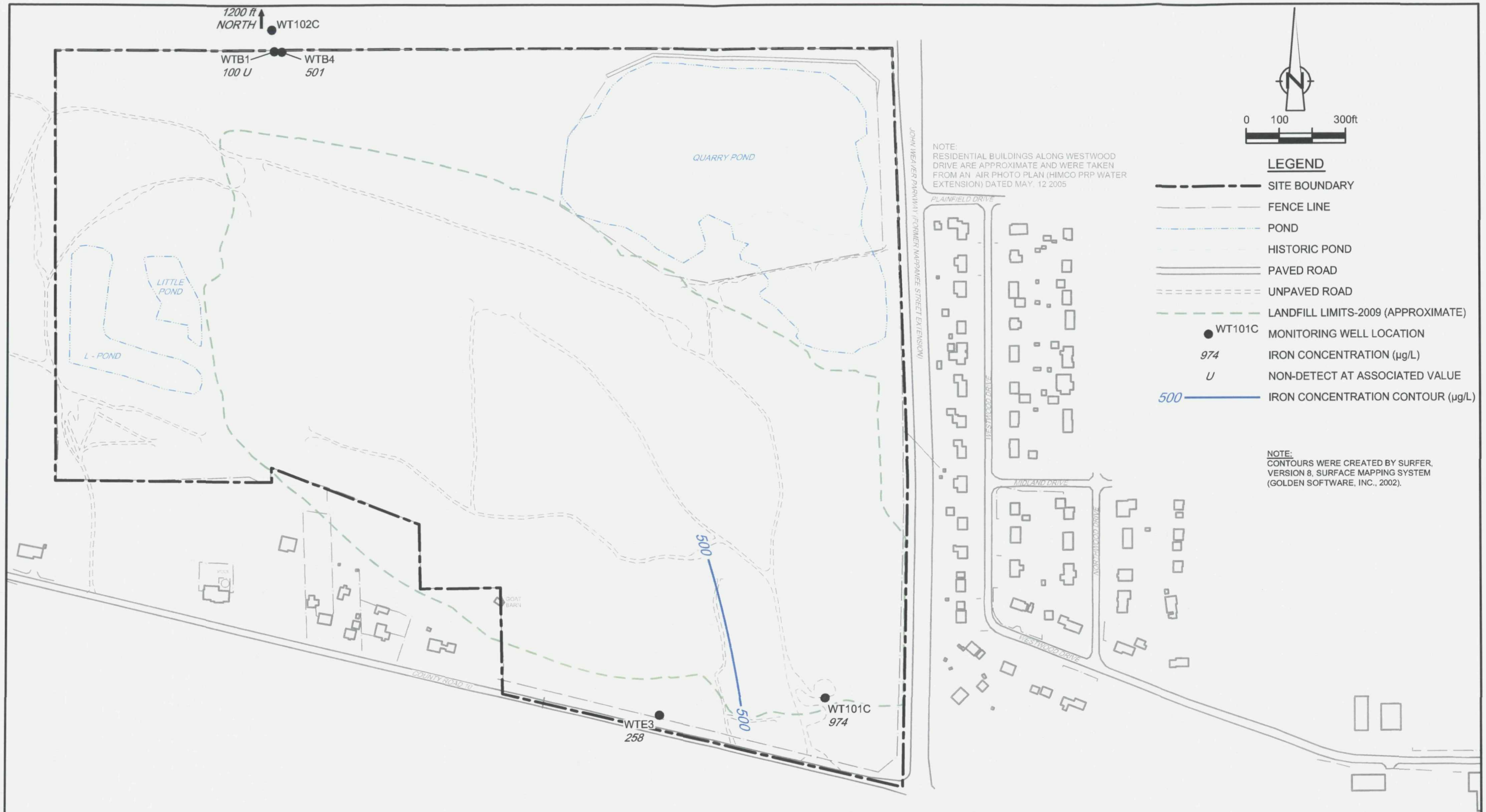


figure 5.3

IRON CONCENTRATION CONTOURS
LOWER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA014 MAR 16/2011

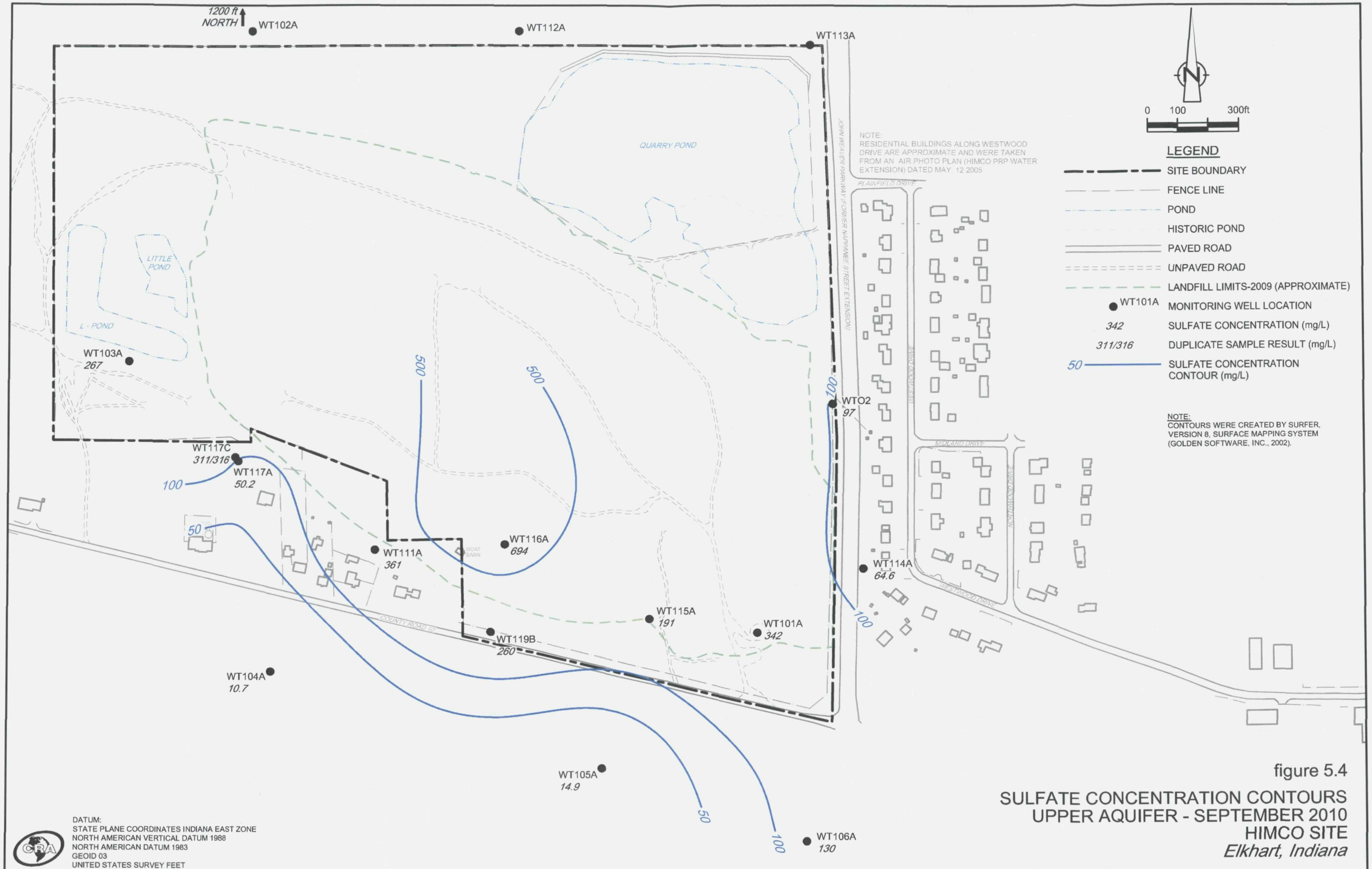


figure 5.4

SULFATE CONCENTRATION CONTOURS
UPPER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA021 APR 14/2011

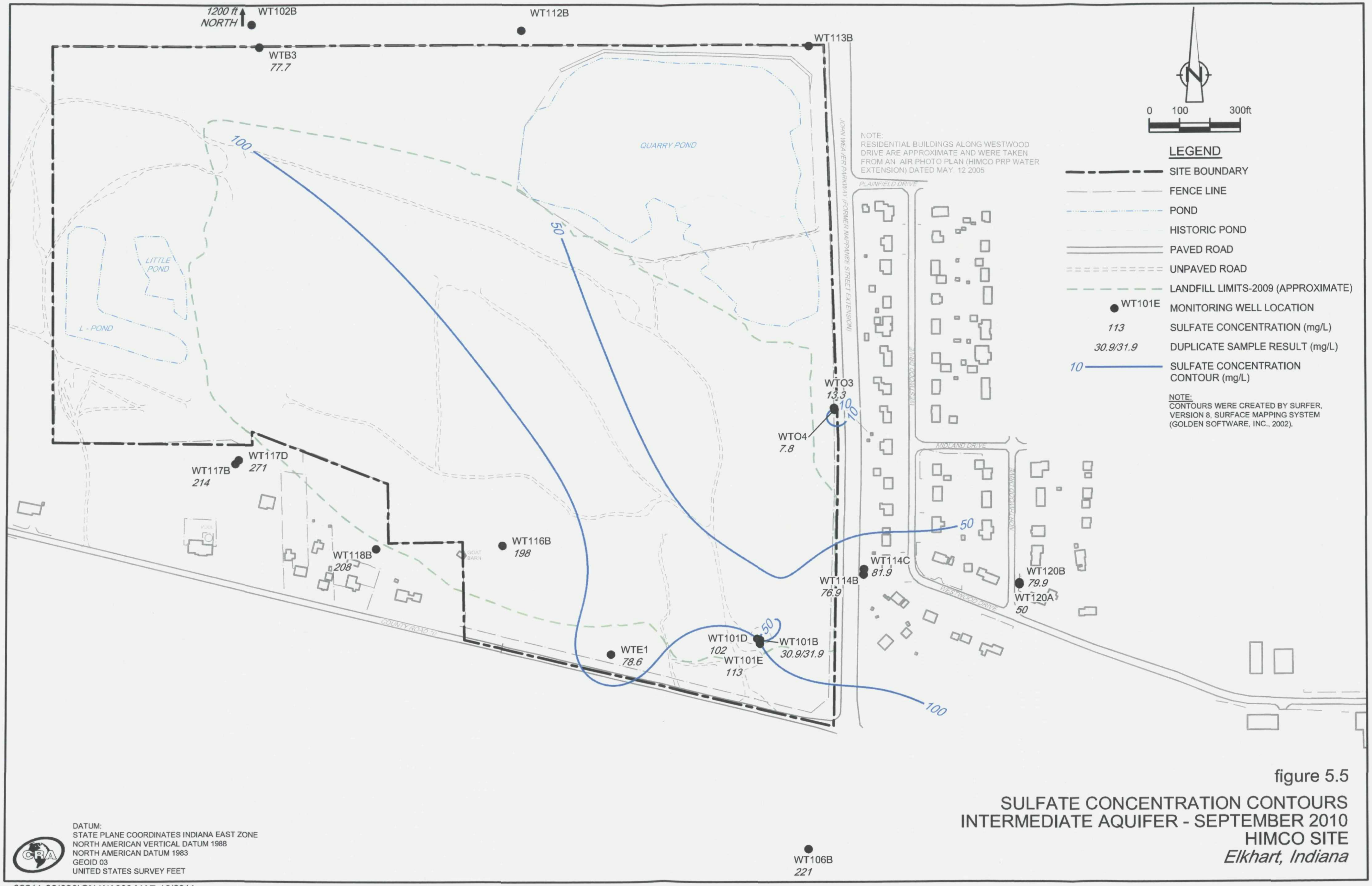


figure 5.5

SULFATE CONCENTRATION CONTOURS
INTERMEDIATE AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA022 MAR 16/2011

figure 5.6

SULFATE CONCENTRATIONS
LOWER AQUIFER - SEPTEMBER 2010
HIMCO SITE
Elkhart, Indiana

DATUM:
STATE PLANE COORDINATES INDIANA EAST ZONE
NORTH AMERICAN VERTICAL DATUM 1988
NORTH AMERICAN DATUM 1983
GEOID 03
UNITED STATES SURVEY FEET

39611-00(030)GN-WA023 APR 14/2011

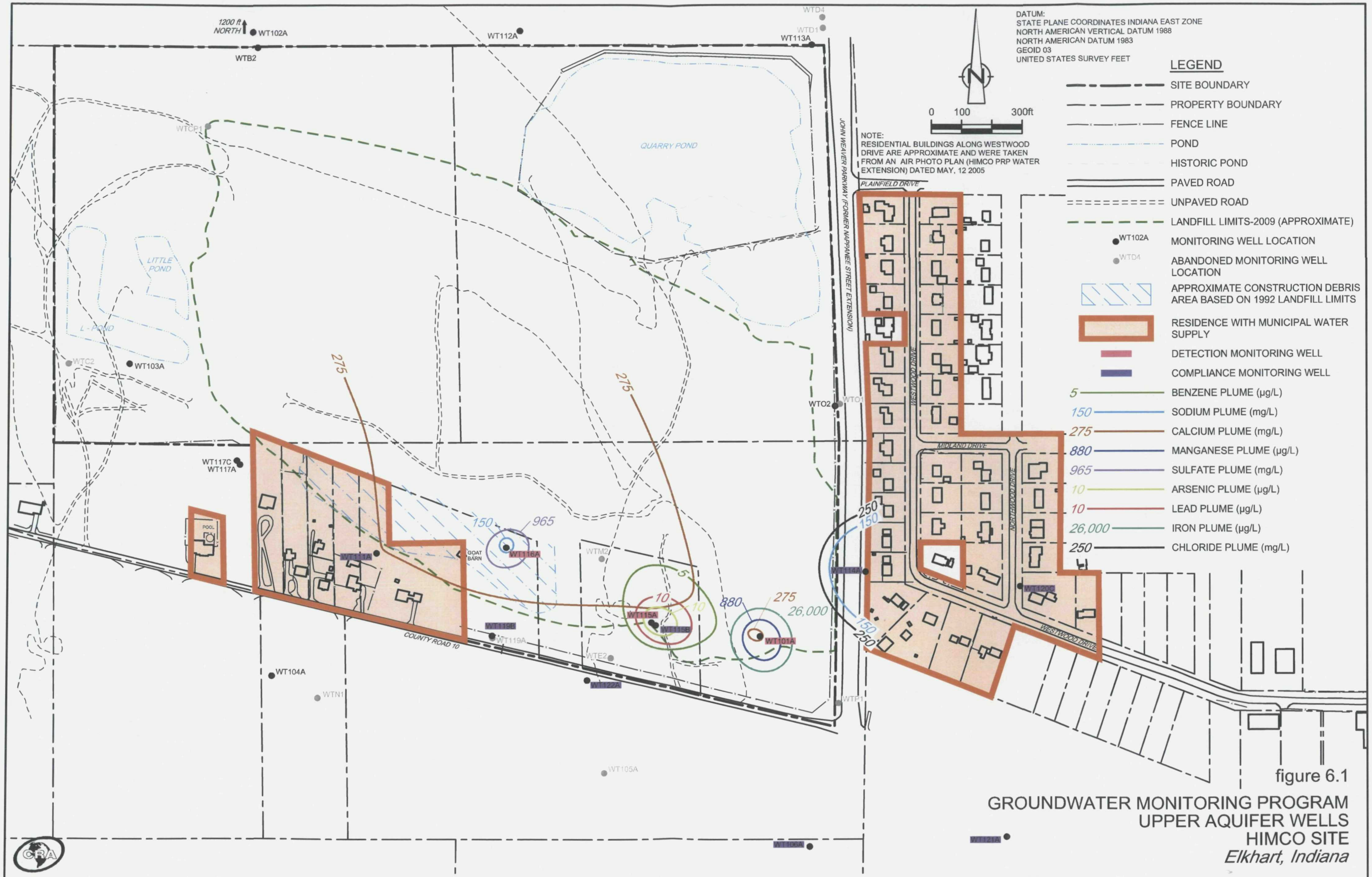


figure 6.1

GROUNDWATER MONITORING PROGRAM
UPPER AQUIFER WELLS
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA037 APR 14/2011

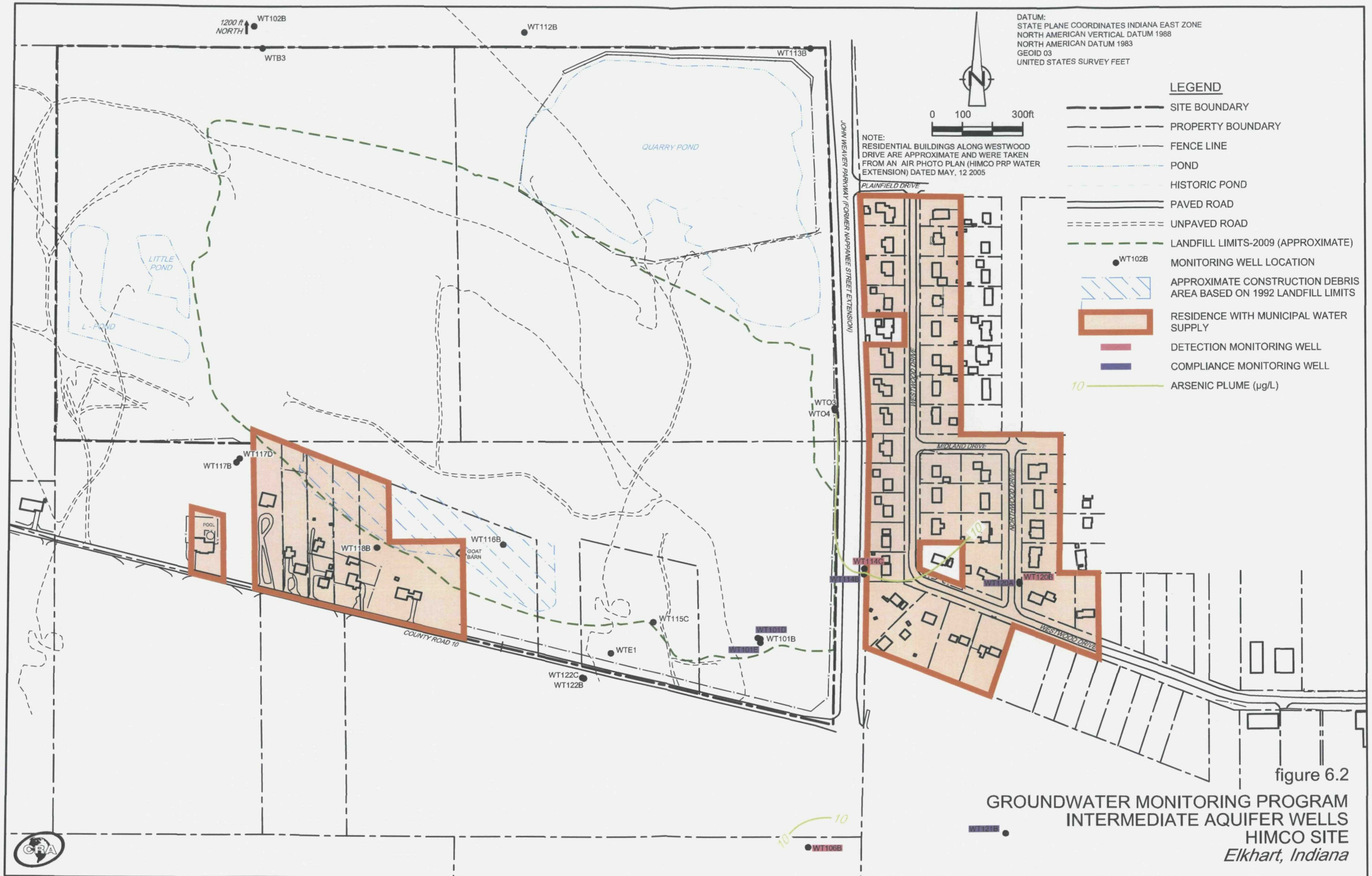


figure 6.2

GROUNDWATER MONITORING PROGRAM
INTERMEDIATE AQUIFER WELLS
HIMCO SITE
Elkhart, Indiana

39611-00(030)GN-WA037 APR 14/2011

TABLES

TABLE 2.1

MONITORING WELL STATUS
HIMCO SITE
ELKHART, INDIANA

Well ID	Status	Installation Date	Screen Length (ft)	Material	Casing Diameter (inches)	Installed Depth (ft bgs)	Reference Elevation (ft AMSL)	Ground Surface (ft AMSL)	Top of Well Screen (ft AMSL)	Bottom of Well Screen (ft AMSL)	Aquifer Designation	Northing	Easting
UPPER AQUIFER WELLS (760 - 710 ft AMSL)													
WT101A	Functional	11/12/1990	10.00	Stainless Steel	2	16.3	763.87	761.53	755.23	745.23	Upper	2351887.26	235722.25
WT102A	Functional	11/10/1990	10.00	Stainless Steel	2	16.0	768.50	766.19	760.19	750.19	Upper	2355111.73	234055.37
WT103A	Functional	11/11/1990	10.00	Stainless Steel	2	16.0	760.11	757.60	751.60	741.60	Upper	2352799.65	233645.99
WT104A	Functional	11/12/1990	10.00	Stainless Steel	2	16.3	765.01	762.32	756.02	746.02	Upper	2351753.99	234123.86
WT105A	Abandoned	11/10/1990	10.00	Stainless Steel	2	16.0	762.37	760.07	754.07	744.07	Upper	2351430.59	235211.48
WT106A	Functional	11/9/1990	10.00	Stainless Steel	2	16.3	761.00	758.46	752.16	742.16	Upper	2351184.52	235885.61
WT111A	Functional	9/10/1991	10.00	Stainless Steel	2	20.0	766.00	764.30	754.30	744.30	Upper	2352165.35	234465.00
WT112A	Functional	8/23/1995	10.00	PVC	2	15.4	765.28	763.71	758.31	748.31	Upper	2353912.48	234933.96
WT113A	Functional	8/10/1995	10.00	PVC	2	21.7	771.27	769.32	757.62	747.62	Upper	2353866.00	235898.24
WT114A	Functional	8/21/1995	10.00	PVC	2	22.0	768.62	766.82	754.82	744.82	Upper	2352102.29	236069.62
WT115A	Functional	8/22/1995	10.00	PVC	2	17.4	765.48	763.28	755.88	745.88	Upper	2351932.43	235367.05
WT115B	Functional	2/22/2011	5.00	PVC	2	28.0	765.88	762.70	739.70	734.70	Upper	2351923.33	235380.73
WT116A	Functional	8/17/1995	10.00	PVC	2	12.6	763.35	761.30	758.70	748.70	Upper	2352184.92	234891.00
WT117A	Functional	8/15/1995	10.00	PVC	2	15.5	766.70	764.66	759.16	749.16	Upper	2352463.27	234015.45
WT117C	Functional	5/6/2010	5.00	PVC	2	28.0	766.53	763.74	740.74	735.71	Upper	2352476.42	234005.49
WT119A	Damaged	10/14/1998	10.00	PVC	2	17.5	Not Surveyed				Upper	Not Surveyed	
WT119B	Functional	5/10/2010	10.00	PVC	2	18.0	762.62	760.32	752.32	742.32	Upper	2351888.96	234845.50
WT120C	Functional	2/24/2011	5.00	PVC	2	17.0	762.11	762.57	750.57	745.57	Upper	2352052.29	236578.54
WT121A	Functional	2/28/2011	5.00	PVC	2	24.0	758.48	758.87	739.87	734.87	Upper	2351213.71	236533.21
WT122A	Functional	2/23/2011	5.00	PVC	2	25.0	762.58	763.03	743.03	738.03	Upper	2351740.44	235154.91
WTB2	Damaged	11/3/1977	10.00	Black Steel	2	11.9	762.70	760.82	758.92	748.92	Upper	2353858.07	234068.99
WTO1	Destroyed	5/1/1979	5.00	PVC	2	30.0	Not Surveyed				Upper	Not Surveyed	
WTO2	Functional	5/5/2010	5.00	PVC	2	37.0	765.95	763.15	731.15	726.15	Upper	2352659.27	235970.66

TABLE 2.1

MONITORING WELL STATUS
HIMCO SITE
ELKHART, INDIANA

Well ID	*Status*	*Installation Date*	*Screen Length (ft)*	*Material*	*Casing Diameter (inches)*	*Installed Depth (ft bgs)*	*Reference Elevation (ft AMSL)*	*Ground Surface (ft AMSL)*	*Top of Well Screen (ft AMSL)*	*Bottom of Well Screen (ft AMSL)*	*Aquifer Designation*	*Northing*	*Easting*
INTERMEDIATE AQUIFER WELLS (710 - 610 ft AMSL)													
WT101B	Functional	12/14/1990	5.00	Stainless Steel	2	98.0	763.70	761.28	668.28	663.28	Intermediate	2351874.60	235726.81
WT101D	Functional	5/3/2010	5.00	PVC	2	63.0	763.62	761.63	703.63	698.30	Intermediate	2351877.84	235718.22
WT101E	Functional	5/4/2010	5.00	PVC	2	123.0	763.40	761.52	643.52	638.52	Intermediate	2351861.93	235726.50
WT102B	Functional	12/2/1990	5.00	Stainless Steel	2	65.4	768.22	765.87	705.47	700.47	Intermediate	2355133.90	234051.70
WT106B	Functional	5/10/2010	5.00	PVC	2	115.0	761.53	758.71	648.71	643.71	Intermediate	2351175.05	235885.57
WT112B	Functional	8/23/1995	5.00	PVC	2	59.4	765.54	763.55	709.15	704.15	Intermediate	2353912.39	234943.21
WT113B	Functional	8/10/1995	5.00	PVC	2	67.2	771.47	769.52	707.32	702.32	Intermediate	2353861.31	235888.26
WT114B	Functional	8/22/1995	5.00	PVC	2	65.3	768.77	766.95	706.65	701.65	Intermediate	2352092.21	236067.36
WT114C	Functional	5/11/2010	5.00	PVC	2	127.0	768.87	766.14	644.14	639.14	Intermediate	2352110.84	236068.83
WT115C	Functional	2/22/2011	5.00	PVC	2	68.0	765.71	762.51	699.51	694.51	Intermediate	2351929.28	235375.59
WT116B	Functional	8/17/1995	5.00	PVC	2	58.4	763.33	762.04	708.64	703.64	Intermediate	2352190.18	234881.80
WT117B	Functional	8/14/1995	5.00	PVC	2	61.3	766.13	764.20	707.90	702.90	Intermediate	2352463.66	234002.76
WT117D	Functional	5/6/2010	5.00	PVC	2	112.0	766.58	763.90	656.90	651.90	Intermediate	2352476.61	234013.25
WT118B	Functional	8/18/1995	5.00	PVC	2	62.5	765.99	763.56	706.06	701.06	Intermediate	2352178.19	234466.70
WT120A	Functional	5/12/2010	5.00	PVC	2	73.0	762.19	762.43	694.43	689.43	Intermediate	2352059.17	236578.58
WT120B	Functional	5/12/2010	5.00	PVC	2	117.0	762.18	762.58	650.58	645.58	Intermediate	2352065.60	236578.16
WT121B	Functional	2/28/2011	5.00	PVC	2	63.0	758.46	758.74	700.74	695.74	Intermediate	2351219.53	236532.99
WT122B	Functional	2/23/2011	5.00	PVC	2	63.0	762.75	762.98	704.98	699.98	Intermediate	2351740.49	235148.61
WT122C	Functional	2/24/2011	5.00	PVC	2	103.0	762.63	762.97	664.97	659.97	Intermediate	2351743.38	235142.97
WTB3	Functional	10/17/1977	10.00	PVC	5	135.0	762.74	760.62	635.62	625.62	Intermediate	2353858.37	234077.13
WTE1	Functional	10/11/1977	10.00	PVC	5	81.0	765.21	762.54	691.54	681.54	Intermediate	2351825.29	235236.36
WTO3	Functional	5/5/2010	5.00	PVC	2	92.0	765.65	763.00	676.00	671.00	Intermediate	2352652.85	235969.84
WTO4	Functional	5/4/2010	5.00	PVC	2	132.0	765.29	762.77	635.77	630.77	Intermediate	2352646.28	235971.31

TABLE 2.1

MONITORING WELL STATUS
HIMCO SITE
ELKHART, INDIANA

Well ID	*Status*	*Installation Date*	*Screen Length (ft)*	*Material*	*Casing Diameter (inches)*	*Installed Depth (ft bgs)*	*Reference Elevation (ft AMSL)*	*Ground Surface (ft AMSL)*	*Top of Well Screen (ft AMSL)*	*Bottom of Well Screen (ft AMSL)*	*Aquifer Designation*	*Northing*	*Easting*
LOWER AQUIFER WELLS (610 - 275 ft AMSL)													
WT101C	Functional	12/12/1990	5.00	Stainless Steel	2	165.0	763.57	760.93	600.93	595.93	Lower	2351860.60	235732.84
WT102C	Functional	12/1/1990	5.00	Stainless Steel	2	159.5	768.65	765.94	611.44	606.44	Lower	2355123.61	234053.78
WT106C	Functional	3/30/2011	5.00	PVC	2	208.0	757.72	758.06	555.06	550.06	Lower	2351154.95	235894.48
WTB1	Functional	10/6/1977	6.00	PVC	5	473.0	763.06	761.58	294.58	288.58	Lower	2353857.39	234061.79
WTB4	Functional	10/7/1977	5.00	PVC	5	173.0	761.77	760.67	592.67	587.67	Lower	2353855.62	234084.92
WTE3	Functional	10/11/1977	5.00	PVC	5	176.0	764.91	762.27	591.27	586.27	Lower	2351806.96	235231.77

TABLE 2.2

INTERIM GROUNDWATER MONITORING PROGRAM
HIMCO SITE
ELKHART, INDIANA

WT101A	WT114C[(1)]
WT101B	WT115A
WT101C	WT116A
WT101D[(1)]	WT116B[(3)]
WT101E[(1)]	WT117A
WT102A[(2)]	WT117B
WT102B[(2)]	WT117C[(1)]
WT102C[(2)]	WT117D[(1)]
WT103A	WT118B
WT104A	WT119B[(1)]
WT105A	WT120A[(1)]
WT106A	WT120B[(1)]
WT106B[(1)]	WTB1
WT111A	WTB3
WT112A[(2)]	WTB4
WT112B[(2)]	WTE1
WT113A[(2)]	WTE3
WT113B[(2)]	WTO2[(1)]
WT114A	WTO3[(1)]
WT114B	WTO4[(1)]

Notes:

(1) Phase II monitoring well. Routine groundwater sampling commenced June 2010.

(2) Property owner withdrew permission to access the well. Last sample collected in February 2010.

(3) Monitoring well not included in 2008 Baseline Groundwater Monitoring Program due to damage to the well, which was subsequently repaired.

TABLE 2.3

INTERIM GROUNDWATER MONITORING PROGRAM PARAMETER LIST
HIMCO SITE
ELKHART, INDIANA

Volatile Organic Compounds

1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,1-Dichloropropene
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene Dibromide)
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloroethene (total)
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,3-Dichloropropane
1,4-Dichlorobenzene
2,2-Dichloropropane
2-Butanone (Methyl Ethyl Ketone)
2-Chloroethyl vinyl ether
2-Chlorotoluene
2-Hexanone
2-Phenylbutane (sec-Butylbenzene)
4-Chlorotoluene
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)
Acetone
Acrolein
Acrylonitrile
Benzene
Bromobenzene
Bromodichloromethane
Bromoform
Bromomethane (Methyl Bromide)
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chlorobromomethane
Chloroethane
Chloroform (Trichloromethane)
Chloromethane (Methyl Chloride)
cis-1,2-Dichloroethene
cis-1,3-Dichloropropene
Cymene (p-Isopropyltoluene)
Dibromochloromethane
Dichlorofluoromethane
Ethyl Ether
Ethylbenzene
Hexachlorobutadiene
Isopropylbenzene
m&p-Xylene
Methylene chloride
Naphthalene
n-Butylbenzene
n-Propylbenzene
o-Xylene
Styrene
tert-Butylbenzene
Tetrachloroethene
Toluene
Total VOCS
trans-1,2-Dichloroethene
trans-1,3-Dichloropropene
Trichloroethene
Trichlorofluoromethane (CFC-11)
Vinyl acetate
Vinyl chloride
Xylene (total)

TABLE 2.3

INTERIM GROUNDWATER MONITORING PROGRAM PARAMETER LIST
HIMCO SITE
ELKHART, INDIANA

Semi-Volatile Organic Compounds

1,2,4-Trichlorobenzene
1,2-Dichlorobenzene
1,2-Diphenylhydrazine
1,3-Dichlorobenzene
1,4-Dichlorobenzene
2(3H)-Benzothiazolone
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Chloronaphthalene
2-Chlorophenol
2-Methylnaphthalene
2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3,3'-Dichlorobenzidine
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl phenyl ether
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl phenyl ether
4-Methylphenol
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Aniline
Anthracene
Benzidine
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Benzoic acid
Benzyl Alcohol
bis(2-Chloroethoxy)methane
bis(2-Chloroethyl)ether
bis(2-Ethylhexyl)phthalate
Butyl benzylphthalate
Carbazole
Chrysene
Dibenz(a,h)anthracene
Dibenzofuran
Diethyl phthalate
Dimethyl phthalate
Di-n-butylphthalate
Di-n-octyl phthalate
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno(1,2,3-cd)pyrene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodi-n-propylamine
N-Nitrosodiphenylamine
Pentachlorophenol
Phenanthrene
Phenol
Pyrene
Total SVOCS

TABLE 2.3

INTERIM GROUNDWATER MONITORING PROGRAM PARAMETER LIST
HIMCO SITE
ELKHART, INDIANA

Metals

Aluminum	Magnesium
Antimony	Manganese
Arsenic	Mercury
Barium	Nickel
Beryllium	Potassium
Cadmium	Selenium
Calcium	Silver
Chromium Total	Sodium
Cobalt	Thallium
Copper	Tin
Iron	Vanadium
Lead	Zinc

General Chemistry

Bromide
Chloride
Sulfate
Cyanide (total)

TABLE 4.1

SUMMARY OF DETECTED VOCs - Q8 INTERIM GROUNDWATER MONITORING PROGRAM
HIMCO SITE
ELKHART, INDIANA

Sample Location:
Sample ID:
Sample Date:

Parameters	*Units*	*Primary MCL*	*Number of Exceedances*	*Percent of Exceedances*	*Number of Samples*	*Number of Detections*	*Percent of Detections*	*Minimum Detection*	*Maximum Detection*
Volatile Organic Compounds									
1,1-Dichloroethane	µg/L	-	-	-	35	15	42.9%	0.26	5.7
1,2-Dichloropropane	µg/L	5	0	0.0%	35	4	11.4%	0.18	0.51
1,4-Dichlorobenzene	µg/L	75	0	0.0%	35	2	5.7%	0.31	1.8
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	-	-	-	35	4	11.4%	0.58	8.6
Benzene	µg/L	5	1	2.9%	35	8	22.9%	0.24	10
Carbon disulfide	µg/L	-	-	-	35	7	20.0%	0.13	1.1
Chlorobenzene	µg/L	100	0	0.0%	35	1	2.9%	0.45	0.45
Chloroethane	µg/L	-	-	-	35	7	20.0%	0.6	2.4
Chloroform (Trichloromethane)	µg/L	-	-	-	35	1	2.9%	1.4	1.4
cis-1,2-Dichloroethene	µg/L	70	0	0.0%	35	11	31.4%	0.23	0.99
Cyclohexane	µg/L	-	-	-	35	1	2.9%	0.53	0.53
Dichlorodifluoromethane (CFC-12)	µg/L	-	-	-	35	6	17.1%	0.4	0.57
Isopropyl benzene	µg/L	-	-	-	35	1	2.9%	0.27	0.27
Vinyl chloride	µg/L	2	0	0.0%	35	14	40.0%	0.36	1.5

Notes:

J Estimated.
\- Not applicable.
MCL Maximum Contaminant Level.

TABLE 4.2

SUMMARY OF DETECTED SVOCs - Q8 INTERIM GROUNDWATER MONITORING PROGRAM
HIMCO SITE
ELKHART, INDIANA

Sample Location:
Sample ID:
Sample Date:

Parameters	*Units*	*Primary MCL*	*Number of Exceedances*	*Percent of Exceedances*	*Number of Samples*	*Number of Detections*	*Percent of Detections*	*Minimum Detection*	*Maximum Detection*
Semivolatile Organic Compounds									
Acetophenone	µg/L	-	-	-	35	2	5.7%	1.8	2.3
Benzo(g,h,i)perylene	µg/L	-	-	-	35	1	2.9%	0.22	0.22
Benzo(k)fluoranthene	µg/L	-	-	-	35	1	2.9%	0.28	0.28
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	0	0.0%	35	9	25.7%	0.86	3
Butyl benzylphthalate (BBP)	µg/L	-	-	-	35	1	2.9%	0.82	0.82
Chrysene	µg/L	-	-	-	35	1	2.9%	0.25	0.25
Dibenz(a,h)anthracene	µg/L	-	-	-	35	1	2.9%	0.26	0.26
Diethyl phthalate	µg/L	-	-	-	35	1	2.9%	3.8	3.8
Indeno(1,2,3-cd)pyrene	µg/L	-	-	-	35	1	2.9%	0.21	0.21
Phenol	µg/L	-	-	-	35	2	5.7%	1.3	3.2

Notes:

- Not applicable.
MCL Maximum Contaminant Level.

TABLE 4.3

UPPER AQUIFER SUMMARY OF DETECTED METALS AND GENERAL CHEMISTRY PARAMETERS
Q8 INTERIM GROUNDWATER MONITORING PROGRAM
HIMCO SITE
ELKHART, INDIANA

Parameters	*Units*	*Primary MCL*	*RSL Tapwater*	*RDA*	*Secondary MCL*	*BV*	*GW RAO*	*Number of Exceedances*	*Percentage of Exceedances*	*Number of Samples*	*Number of Detections*	*Percentage of Detections*
Metals												
Aluminum	µg/L	-	37000	-	50	860	37000	0	0.0%	14	8	57.1%
Antimony	µg/L	6	15	-	-	42.2 UJ	42.2 UJ	0	0.0%	14	4	28.6%
Arsenic	µg/L	10	0.045	-	-	6.9 U	10	0	0.0%	14	11	78.6%
Barium	µg/L	2000	7300	-	-	75	2000	0	0.0%	14	13	92.9%
Beryllium	µg/L	4	73	-	-	3.1 BJ	4	0	0.0%	14	4	28.6%
Cadmium	µg/L	5	18	-	-	4.6 UJ	5	Not Detected		14	0	0.0%
Calcium	µg/L	-	-	250000	-	275000	275000	2	14.3%	14	14	100.0%
Chromium	µg/L	100	-	-	-	1180	1180	0	0.0%	14	5	35.7%
Cobalt	µg/L	-	11	-	-	50 U	50 U	0	0.0%	14	3	21.4%
Copper	µg/L	1300	1500	-	1000	50.6	1300	0	0.0%	14	4	28.6%
Iron	µg/L	-	26000	-	300	7720	26000	0	0.0%	14	13	92.9%
Lead	µg/L	15	-	-	-	3.0 U	15	0	0.0%	14	1	7.1%
Magnesium	µg/L	-	-	-	-	-	-	-	-	14	14	100.0%
Manganese	µg/L	-	880	-	50	712	880	1	7.1%	14	13	92.9%
Mercury	µg/L	2	0.57	-	-	0.2 U	2	N/A	N/A	14	0	0.0%
Nickel	µg/L	-	-	-	-	-	-	-	-	14	3	21.4%
Potassium	µg/L	-	-	-	-	-	-	-	-	14	14	100.0%
Selenium	µg/L	50	180	-	-	6.0 UJ	50	Not Detected		14	0	0.0%
Silver	µg/L	-	180	-	-	19.5	19.5	Not Detected		14	0	0.0%
Sodium	µg/L	-	-	150000	-	106000	150000	2	14.3%	14	14	100.0%
Thallium	µg/L	2	-	-	-	12.35	12.35	0	0.0%	14	1	7.1%
Vanadium	µg/L	-	2.6	-	-	50 U	50 U	0	0.0%	14	6	42.9%
Zinc	µg/L	-	11000	-	5000	34.1 U	11000	0	0.0%	14	1	7.1%
General Chemistry												
Bromide	mg/L	-	-	-	-	-	-	-	-	14	8	57.1%
Chloride	mg/L	-	-	-	250	258	258	1	7.1%	14	14	100.0%
Cyanide (total)	mg/L	0.2	-	-	-	0.01 U	0.2	0	0.0%	14	3	21.4%
Sulfate	mg/L	-	-	-	250	965	965	0	0.0%	14	14	100.0%

Notes:

J	Estimated.
-	Not applicable.
MCL	Maximum Contaminant Level.
RDA	Recommended Daily Allowance.
BV	Background Value.
GW RAO	Groundwater Remedial Action Objective.

TABLE 4.4

INTERMEDIATE AQUIFER SUMMARY OF DETECTED METALS AND GENERAL CHEMISTRY PARAMETERS
Q8 INTERIM GROUNDWATER MONITORING PROGRAM
HIMCO SITE
ELKHART, INDIANA

Parameters	*Units*	*Primary MCL*	*RSL Tapwater*	*RDA*	*Secondary MCL*	*BV*	*GW RAO*	*Number of Exceedances*	*Percentage of Exceedances*	*Number of Samples*	*Number of Detections*	*Percentage of Detections*
Metals												
Aluminum	µg/L	-	37000	-	50	860	37000	0	0.0%	17	6	35.3%
Antimony	µg/L	6	15	-	-	37 U	37 U	0	0.0%	17	2	11.8%
Arsenic	µg/L	10	0.045	-	-	7.9	10	2	11.8%	17	17	100.0%
Barium	µg/L	2000	7300	-	-	133	2000	0	0.0%	17	17	100.0%
Beryllium	µg/L	4	73	-	-	2.7 U	4	0	0.0%	17	6	35.3%
Cadmium	µg/L	5	18	-	-	3.05 U	5	Not Detected		17	0	0.0%
Calcium	µg/L	-	-	250000	-	86000	250000	0	0.0%	17	17	100.0%
Chromium	µg/L	100	-	-	-	89	100	0	0.0%	17	2	11.8%
Cobalt	µg/L	-	11	-	-	50 U	50 U	Not Detected		17	0	0.0%
Copper	µg/L	1300	1500	-	1000	25 U	1300	0	0.0%	17	1	5.9%
Iron	µg/L	-	26000	-	300	1870	26000	0	0.0%	17	17	100.0%
Lead	µg/L	15	-	-	-	3.0 U	15	Not Detected		17	0	0.0%
Magnesium	µg/L	-	-	-	-	-	-	-	-	17	17	100.0%
Manganese	µg/L	-	880	-	50	173	880	0	0.0%	17	17	100.0%
Mercury	µg/L	2	0.57	-	-	0.20 U	2	Not Detected		17	0	0.0%
Nickel	µg/L	-	-	-	-	-	-	-	-	17	2	11.8%
Potassium	µg/L	-	-	-	-	-	-	-	-	17	17	100.0%
Selenium	µg/L	50	180	-	-	5.0 U	50	Not Detected		17	0	0.0%
Silver	µg/L	-	180	-	-	10 U	180	Not Detected		17	0	0.0%
Sodium	µg/L	-	-	150000	-	31100	150000	0	0.0%	17	17	100.0%
Thallium	µg/L	2	-	-	-	9.85	9.85	0	0.0%	17	2	11.8%
Vanadium	µg/L	-	2.6	-	-	50.0 U	50.0 U	Not Detected		17	0	0.0%
Zinc	µg/L	-	11000	-	5000	34.1 U	11000	Not Detected		17	0	0.0%
General Chemistry												
Bromide	mg/L	-	-	-	-	-	-	-	-	17	5	29.4%
Chloride	mg/L	-	-	-	250	55	250	0	0.0%	17	17	100.0%
Cyanide (total)	mg/L	0.2	-	-	-	0.01 U	0.2	0	0.0%	17	4	23.5%
Sulfate	mg/L	-	-	-	250	430	430	0	0.0%	17	17	100.0%

Notes:

J	Estimated.
-	Not applicable.
MCL	Maximum Contaminant Level.
RDA	Recommended Daily Allowance.
BV	Background Value.
GW RAO	Groundwater Remedial Action Objective.

TABLE 4.5

LOWER AQUIFER SUMMARY OF DETECTED METALS AND GENERAL CHEMISTRY PARAMETERS
Q8 INTERIM GROUNDWATER MONITORING PROGRAM
HIMCO SITE
ELKHART, INDIANA

Parameters	*Units*	*Primary MCL*	*RSL Tapwater*	*RDA*	*Secondary MCL*	*BV*	*GW RAO*	*Number of Exceedances*	*Percentage of Exceedances*	*Number of Samples*	*Number of Detections*	*Percentage of Detections*
Metals												
Aluminum	μg/L	-	37000	-	50	860	37000	0	0%	4	1	25%
Antimony	μg/L	6	15	-	-	1.89	6	0	0%	4	1	25%
Arsenic	μg/L	10	0.045	-	-	5.17	10	0	0%	4	3	75%
Barium	μg/L	2000	7300	-	-	346	2000	0	0%	4	4	100%
Beryllium	μg/L	4	73	-	-	4.5 BJ	4.5 BJ	0	0%	4	2	50%
Cadmium	μg/L	5	18	-	-	1.0 U	5	Not Detected		4	0	0%
Calcium	μg/L	-	-	250000	-	122000	250000	0	0%	4	4	100%
Chromium	μg/L	100	-	-	-	33.6	100	Not Detected		4	0	0%
Cobalt	μg/L	-	11	-	-	50 U	50 U	Not Detected		4	0	0%
Copper	μg/L	1300	1500	-	1000	25 U	1300	Not Detected		4	0	0%
Iron	μg/L	-	26000	-	300	4930	26000	0	0%	4	3	75%
Lead	μg/L	15	-	-	-	3.0 U	15	Not Detected		4	0	0%
Magnesium	μg/L	-	-	-	-	-	-	-	-	4	4	100%
Manganese	μg/L	-	880	-	50	570	880	0	0%	4	3	75%
Mercury	μg/L	2	0.57	-	-	0.2 U	2	Not Detected		4	0	0%
Nickel	μg/L	-	-	-	-	-	-	-	-	4	1	25%
Potassium	μg/L	-	-	-	-	-	-	-	-	4	3	75%
Selenium	μg/L	50	180	-	-	5.0 U	50	Not Detected		4	0	0%
Silver	μg/L	-	180	-	-	10.0 U	180	Not Detected		4	0	0%
Sodium	μg/L	-	-	150000	-	70800	150000	0	0%	4	4	100%
Thallium	μg/L	2	-	-	-	1.0 U	2	0	0%	4	1	25%
Vanadium	μg/L	-	2.6	-	-	59	59	Not Detected		4	0	0%
Zinc	μg/L	-	11000	-	5000	40	11000	Not Detected		4	0	0%
General Chemistry												
Bromide	mg/L	-	-	-	-	-	-	-	-	4	3	75%
Chloride	mg/L	-	-	-	250	71.8	250	0	0%	4	4	100%
Cyanide (total)	mg/L	0.2	-	-	-	0.01 U	0.2	Not Detected		4	0	0%
Sulfate	mg/L	-	-	-	250	68.7	250	0	0%	4	4	100%

Notes:

J	Estimated.
-	Not applicable.
MCL	Maximum Contaminant Level.
RDA	Recommended Daily Allowance.
BV	Background Value.
GW RAO	Groundwater Remedial Action Objective.

TABLE 5.1

SUMMARY OF DETECTED VOCs - INTERIM GROUNDWATER MONITORING PROGRAM
HIMCO SITE
ELKHART, INDIANA

Sample Location:
Sample ID:
Sample Date:

Parameters	*Units*	*Primary MCL*	*Number of Exceedances*	*Percent of Exceedances*	*Number of Samples*	*Number of Detects*	*Percent of Detections*	*Minimum Detection*	*Maximum Detection*
Volatile Organic Compounds									
1,1-Dichloroethane	µg/L	-	-	-	247	76	31%	0.23	7.4
1,2,4-Trichlorobenzene	µg/L	70	0	0.0%	247	1	0%	0.27	0.27
1,2-Dichloroethane	µg/L	5	0	0.0%	247	1	0%	0.25	0.25
1,2-Dichloropropane	µg/L	5	0	0.0%	247	27	11%	0.18	0.52
1,4-Dichlorobenzene	µg/L	75	0	0.0%	247	12	5%	0.24	3.2
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	-	-	-	247	28	11%	0.58	9.7
Acetone	µg/L	-	-	-	247	14	6%	1.1	6.3
Benzene	µg/L	5	8	3.2%	247	45	18%	0.24	12
Bromodichloromethane	µg/L	-	-	-	247	2	1%	0.22	0.64
Bromoform	µg/L	-	-	-	247	1	0%	0.75	0.75
Carbon disulfide	µg/L	-	-	-	247	49	20%	0.13	3.6
Chlorobenzene	µg/L	100	0	0.0%	247	8	3%	0.2	0.64
Chloroethane	µg/L	-	-	-	247	27	11%	0.43	3.4
Chloroform (Trichloromethane)	µg/L	-	-	-	247	12	5%	0.18	1.4
Chloromethane (Methyl chloride)	µg/L	-	-	-	247	9	4%	0.3	0.55
cis-1,2-Dichloroethene	µg/L	70	0	0.0%	247	59	24%	0.21	2.4
Cyclohexane	µg/L	-	-	-	247	11	4%	0.12	0.91
Dibromochloromethane	µg/L	-	-	-	247	2	1%	0.54	0.87
Dichlorodifluoromethane (CFC-12)	µg/L	-	-	-	247	22	9%	0.32	1.6
Isopropyl benzene	µg/L	-	-	-	247	16	6%	0.15	0.46
Toluene	µg/L	1000	0	0.0%	247	2	1%	0.19	0.52
trans-1,2-Dichloroethene	µg/L	100	0	0.0%	247	1	0%	0.19	0.19
Trichloroethene	µg/L	5	0	0.0%	247	4	2%	0.37	0.66
Vinyl chloride	µg/L	2	0	0.0%	247	74	30%	0.22	2

Notes:

J Estimated.
\- Not applicable.
MCL Maximum Contaminant Level.

TABLE 5.2

SUMMARY OF DETECTED SVOCs - INTERIM GROUNDWATER MONITORING PROGRAM
HIMCO SITE
ELKHART, INDIANA

Sample Location:
Sample ID:
Sample Date:

Parameters	*Units*	*Primary MCL*	*Number of Exceedances*	*Percent of Exceedances*	*Number of Samples*	*Number of Detects*	*Percent of Detections*	*Minimum Detection*	*Maximum Detection*
Semivolatile Organic Compounds									
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	µg/L	-	-	-	247	1	0.4%	0.76	0.76
2,6-Dinitrotoluene	µg/L	-	-	-	247	1	0.4%	1.8	1.8
4-Methylphenol	µg/L	-	-	-	247	6	2.4%	0.89	3.2
Acenaphthene	µg/L	-	-	-	247	1	0.4%	0.22	0.22
Acenaphthylene	µg/L	-	-	-	247	1	0.4%	0.22	0.22
Acetophenone	µg/L	-	-	-	247	25	10.1%	0.38	2.7
Anthracene	µg/L	-	-	-	247	1	0.4%	0.23	0.23
Benzo(a)anthracene	µg/L	-	-	-	247	1	0.4%	0.24	0.24
Benzo(b)fluoranthene	µg/L	-	-	-	247	1	0.4%	0.24	0.24
Benzo(g,h,i)perylene	µg/L	-	-	-	247	1	0.4%	0.22	0.22
Benzo(k)fluoranthene	µg/L	-	-	-	247	1	0.4%	0.28	0.28
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	2	0.81%	247	42	17.0%	0.84	13
Butyl benzylphthalate (BBP)	µg/L	-	-	-	247	3	1.2%	0.82	5.1
Caprolactam	µg/L	-	-	-	247	3	1.2%	0.92	2.8
Chrysene	µg/L	-	-	-	247	2	0.8%	0.2	0.25
Dibenz(a,h)anthracene	µg/L	-	-	-	247	1	0.4%	0.26	0.26
Diethyl phthalate	µg/L	-	-	-	247	8	3.2%	2	8.2
Di-n-butylphthalate (DBP)	µg/L	-	-	-	247	4	1.6%	0.71	1
Fluoranthene	µg/L	-	-	-	247	3	1.2%	0.31	0.36
Indeno(1,2,3-cd)pyrene	µg/L	-	-	-	247	1	0.4%	0.21	0.21
Phenanthrene	µg/L	-	-	-	247	2	0.8%	0.25	0.5
Phenol	µg/L	-	-	-	247	5	2.0%	1.3	3.2
Pyrene	µg/L	-	-	-	247	4	1.6%	0.23	0.25

Notes:

- Not applicable.

MCL Maximum Contaminant Level.

TABLE 5.3

UPPER AQUIFER SUMMARY OF DETECTED METALS AND GENERAL CHEMISTRY PARAMETERS
INTERIM GROUNDWATER MONITORING PROGRAM
HIMCO SITE
ELKHART, INDIANA

Parameters	*Units*	*Primary MCL*	*RSL Tapwater*	*RDA*	*Secondary MCL*	*BV*	*GW RAO*	*Number of Exceedances*	*Percentage of Exceedances*	*Number of Samples*	*Number of Detections*	*Percentage of Detections*
Metals												
Aluminum	µg/L	-	37000	-	50	860	37000	3	2.7%	110	76	69.1%
Antimony	µg/L	6	15	-	-	42.2 UJ	42.2 UJ	0	0.0%	110	37	33.6%
Arsenic	µg/L	10	0.045	-	-	6.9 U	10	3	2.7%	110	91	82.7%
Barium	µg/L	2000	7300	-	-	75	2000	0	0.0%	110	107	97.3%
Beryllium	µg/L	4	73	-	-	3.1 BJ	4	2	1.8%	110	20	18.2%
Cadmium	µg/L	5	18	-	-	4.6 UJ	5	0	0.0%	110	2	1.8%
Calcium	µg/L	-	-	250000	-	275000	275000	19	17.3%	110	110	100.0%
Chromium	µg/L	100	-	-	-	1180	1180	0	0.0%	110	51	46.4%
Cobalt	µg/L	-	11	-	-	50 U	50 U	2	1.8%	110	39	35.5%
Copper	µg/L	1300	1500	-	1000	50.6	1300	0	0.0%	110	22	20.0%
Iron	µg/L	-	26000	-	300	7720	26000	11	10.0%	110	94	85.5%
Lead	µg/L	15	-	-	-	3.0 U	15	4	3.6%	110	11	10.0%
Magnesium	µg/L	-	-	-	-	-	-	-	-	110	110	100.0%
Manganese	µg/L	-	880	-	50	712	880	9	8.2%	110	102	92.7%
Mercury	µg/L	2	0.57	-		0.2 U	2	0	0.0%	110	5	4.5%
Nickel	µg/L	-	-	-	-	-	-	-	-	110	47	42.7%
Potassium	µg/L	-	-	-	-	-	-	-	-	110	102	92.7%
Selenium	µg/L	50	180	-	-	6.0 UJ	50	0	0.0%	110	4	3.6%
Silver	µg/L	-	180	-	-	19.5	19.5	Not Detected		110	0	0.0%
Sodium	µg/L	-	-	150000	-	106000	150000	11	10.0%	110	110	100.0%
Thallium	µg/L	2	-	-	-	12.35	12.35	0	0.0%	110	14	12.7%
Vanadium	µg/L	-	2.6	-	-	50 U	50 U	3	2.7%	110	46	41.8%
Zinc	µg/L	-	11000	-	5000	34.1 U	11000	0	0.0%	110	29	26.4%
General Chemistry												
Bromide	mg/L	-	-	-	-	-	-	-	-	110	33	30.0%
Chloride	mg/L	-	-	-	250	258	258	8	7.3%	110	110	100.0%
Cyanide (total)	mg/L	0.2	-	-	-	0.01 U	0.2	0	0.0%	97	8	8.2%
Sulfate	mg/L	-	-	-	250	965	965	3	2.7%	110	110	100.0%

Notes:

J	Estimated.
-	Not applicable.
MCL	Maximum Contaminant Level.
RDA	Recommended Daily Allowance.
BV	Background Value.
GW RAO	Groundwater Remedial Action Objective.

TABLE 5.4

INTERMEDIATE AQUIFER SUMMARY OF DETECTED METALS AND GENERAL CHEMISTRY PARAMETERS
INTERIM GROUNDWATER MONITORING PROGRAM
HIMCO SITE
ELKHART, INDIANA

Parameters	*Units*	*Primary MCL*	*RSL Tapwater*	*RDA*	*Secondary MCL*	*BV*	*GW RAO*	*Number of Exceedances*	*Percentage of Exceedances*	*Number of Samples*	*Number of Detections*	*Percentage of Detections*
Metals												
Aluminum	µg/L	-	37000	-	50	860	37000	0	0.0%	97	18	18.6%
Antimony	µg/L	6	15	-	-	37 U	37 U	0	0.0%	97	12	12.4%
Arsenic	µg/L	10	0.045	-	-	7.9	10	4	4.1%	97	91	93.8%
Barium	µg/L	2000	7300	-	-	133	2000	0	0.0%	97	97	100.0%
Beryllium	µg/L	4	73	-	-	2.7 U	4	0	0.0%	97	9	9.3%
Cadmium	µg/L	5	18	-	-	3.05 U	5	Not Detected		97	0	0.0%
Calcium	µg/L	-	-	250000	-	86000	250000	0	0.0%	97	97	100.0%
Chromium	µg/L	100	-	-	-	89	100	0	0.0%	97	20	20.6%
Cobalt	µg/L	-	11	-	-	50 U	50 U	Not Detected		97	0	0.0%
Copper	µg/L	1300	1500	-	1000	25 U	1300	0	0.0%	97	5	5.2%
Iron	µg/L	-	26000	-	300	1870	26000	0	0.0%	97	97	100.0%
Lead	µg/L	15	-	-	-	3.0 U	15	0	0.0%	97	2	2.1%
Magnesium	µg/L	-	-	-	-	-	-	-	-	97	97	100.0%
Manganese	µg/L	-	880	-	50	173	880	0	0.0%	97	97	100.0%
Mercury	µg/L	2	0.57	-	-	0.20 U	2	0	0.0%	97	2	2.1%
Nickel	µg/L	-	-	-	-	-	-	-	-	97	11	11.3%
Potassium	µg/L	-	-	-	-	-	-	-	-	97	97	100.0%
Selenium	µg/L	50	180	-	-	5.0 U	50	0	0.0%	97	2	2.1%
Silver	µg/L	-	180	-	-	10 U	180	Not Detected		97	0	0.0%
Sodium	µg/L	-	-	150000	-	31100	150000	0	0.0%	97	97	100.0%
Thallium	µg/L	2	-	-	-	9.85	9.85	0	0.0%	97	16	16.5%
Vanadium	µg/L	-	2.6	-	-	50.0 U	50.0 U	Not Detected		97	0	0.0%
Zinc	µg/L	-	11000	-	5000	34.1 U	11000	0	0.0%	97	9	9.3%
General Chemistry												
Bromide	mg/L	-	-	-	-	-	-	-	-	97	24	24.7%
Chloride	mg/L	-	-	-	250	55	250	0	0.0%	97	96	99.0%
Cyanide (total)	mg/L	0.2	-	-	-	0.01 U	0.2	0	0.0%	86	12	14.0%
Sulfate	mg/L	-	-	-	250	430	430	0	0.0%	97	96	99.0%

Notes:

J Estimated.
\- Not applicable.
MCL Maximum Contaminant Level.
RDA Recommended Daily Allowance.
BV Background Value.
GW RAO Groundwater Remedial Action Objective.

TABLE 5.5

LOWER AQUIFER SUMMARY OF DETECTED METALS AND GENERAL CHEMISTRY PARAMETERS
INTERIM GROUNDWATER MONITORING PROGRAM
HIMCO SITE
ELKHART, INDIANA

Parameters	*Units*	*Primary MCL*	*RSL Tapwater*	*RDA*	*Secondary MCL*	*BV*	*GW RAO*	*Number of Exceedances*	*Percentage of Exceedances*	*Number of Samples*	*Number of Detections*	*Percentage of Detections*
Metals												
Aluminum	µg/L	-	37000	-	50	860	37000	0	0.0%	40	16	40.0%
Antimony	µg/L	6	15	-	-	1.89	6	0	0.0%	40	5	12.5%
Arsenic	µg/L	10	0.045	-	-	5.17	10	0	0.0%	40	31	77.5%
Barium	µg/L	2000	7300	-	-	346	2000	0	0.0%	40	40	100.0%
Beryllium	µg/L	4	73	-	-	4.5 BJ	4.5 BJ	0	0.0%	40	3	7.5%
Cadmium	µg/L	5	18	-	-	1.0 U	5	Not Detected		40	0	0.0%
Calcium	µg/L	-	-	250000	-	122000	250000	0	0.0%	40	40	100.0%
Chromium	µg/L	100	-	-	-	33.6	100	0	0.0%	40	17	42.5%
Cobalt	µg/L	-	11	-	-	50 U	50 U	0	0.0%	40	1	2.5%
Copper	µg/L	1300	1500	-	1000	25 U	1300	0	0.0%	40	3	7.5%
Iron	µg/L	-	26000	-	300	4930	26000	0	0.0%	40	39	97.5%
Lead	µg/L	15	-	-	-	3.0 U	15	0	0.0%	40	4	10.0%
Magnesium	µg/L	-	-	-	-	-	-	-	-	40	40	100.0%
Manganese	µg/L	-	880	-	50	570	880	0	0.0%	40	39	97.5%
Mercury	µg/L	2	0.57	-	-	0.2 U	2	0	0.0%	40	2	5.0%
Nickel	µg/L	-	-	-	-	-	-		-	40	16	40.0%
Potassium	µg/L	-	-	-	-	-	-	-	-	40	37	92.5%
Selenium	µg/L	50	180	-	-	5.0 U	50	0	0.0%	40	1	2.5%
Silver	µg/L	-	180	-	-	10.0 U	180	0	0.0%	40	1	2.5%
Sodium	µg/L	-	-	150000	-	70800	150000	0	0.0%	40	40	100.0%
Thallium	µg/L	2	-	-	-	1.0 U	2	0	0.0%	40	7	17.5%
Vanadium	µg/L	-	2.6	-	-	59	59	0	0.0%	40	7	17.5%
Zinc	µg/L	-	11000	-	5000	40	11000	0	0.0%	40	10	25.0%
General Chemistry												
Bromide	mg/L	-	-	-	-	-	-	N/A	N/A	40	21	52.5%
Chloride	mg/L	-	-	-	250	71.8	250	0	0.00%	40	40	100.0%
Cyanide (total)	mg/L	0.2	-	-	-	0.01 U	0.2	0	0.00%	35	5	14.3%
Sulfate	mg/L	-	-	-	250	68.7	250	0	0.00%	39	33	84.6%

Notes:

J	Estimated.
-	Not applicable.
MCL	Maximum Contaminant Level.
RDA	Recommended Daily Allowance.
BV	Background Value.
GW RAO	Groundwater Remedial Action Objective.

TABLE 5.6

WT115A METAL AND GENERAL CHEMISTRY RESULTS SUMMARY
HIMCO
ELKHART, INDIANA

Parameters	*Units*	*Primary MCL*	*RSL Tapwater*	*RDA*	*Secondary MCL*	*BV*	*GW RAO*	*WT115A GW-WT115A-110608-23 11/6/2008*	*WT115A GW-WT115D-110608-24 11/6/2008 Duplicate*	*WT115A GW-WT115A-021209 2/12/2009*
Metals										
Aluminum	µg/L	-	37000	-	50	860	37000	**541000**	**630000**	**100000**
Antimony	µg/L	6	15	-	-	42.2 UJ	42.2 UJ	0.66 J	0.82 J	0.79 J
Arsenic	µg/L	10	0.045	-	-	6.9 U	10	**27.3**	**30.8**	6.9
Barium	µg/L	2000	7300	-	-	75	2000	1220	1400	292
Beryllium	µg/L	4	73	-	-	3.1 BJ	4	**11.1**	**12.9**	2.5
Cadmium	µg/L	5	18	-	-	4.6 UJ	5	1.0 U	5.0 U	1.0 U
Calcium	µg/L	-	-	250000	-	275000	275000	**353000**	**339000**	202000
Chromium	µg/L	100	-	-	-	1180	1180	434	506	90.1
Cobalt	µg/L	-	11	-	-	50 U	50 U	**83.6**	**96.2**	17.4 J
Copper	µg/L	1300	1500	-	1000	50.6	1300	493	570	93.7
Iron	µg/L	-	26000	-	300	7720	26000	**152000**	**177000**	**33400**
Lead	µg/L	15	-	-	-	3.0 U	15	**231**	**280**	**45.1**
Magnesium	µg/L	-	-	-	-	-	-	45100	50800	12200
Manganese	µg/L	-	880	-	50	712	880	689	779	203
Mercury	µg/L	2	0.57	-		0.2 U	2	1.3	1.4	0.23
Nickel	µg/L	-	-	-	-	-	-	481	564	95.5
Potassium	µg/L	-	-	-	-	-	-	30300	34400	7840
Selenium	µg/L	50	180	-	-	6.0 UJ	50	5.0 U	25.0 U	5.0 U
Silver	µg/L	-	180	-	-	19.5	19.5	10.0 U	10.0 U	10.0 U
Sodium	µg/L	-	-	150000	-	106000	150000	20100	18600	14800
Thallium	µg/L	2	-	-	-	12.35	12.35	2.6	2.7	0.70 J
Vanadium	µg/L	-	2.6	-	-	50 U	50 U	**470**	**548**	**112**
Zinc	µg/L	-	11000	-	5000	34.1 U	11000	1130	1370	227
General Chemistry										
Bromide	mg/L	-	-	-	-	-	-	0.40 J	0.40 J	0.30 J
Chloride	mg/L	-	-	-	250	258	258	16.8	17.5	12.8
Cyanide (total)	mg/L	0.2	-	-	-	0.01 U	0.2	-	-	0.010 UJ
Sulfate	mg/L	-	-	-	250	965	965	257	270	199

Notes:

J	Estimated.
-	Not applicable.
MCL	Maximum Contaminant Level.
RDA	Recommended Daily Allowance.
BV	Background Value.
GW RAO	Groundwater Remedial Action Objective.

TABLE 5.6

WT115A METAL AND GENERAL CHEMISTRY RESULTS SUMMARY
HIMCO
ELKHART, INDIANA

Parameters	Units	Primary MCL	RSL Tapwater	RDA	Secondary MCL	BV	GW RAO	WT115A GW-WT115A-050609 5/6/2009	WT115A GW-WT115A-050609-D 5/6/2009 Duplicate	WT115A GW-WT115A-080509 8/5/2009	WT115A GW-WT115A-110609 11/6/2009
Metals											
Aluminum	µg/L	-	37000	-	50	860	37000	21000	19300	17600	3880
Antimony	µg/L	6	15	-	-	42.2 UJ	42.2 UJ	0.74 J	0.70 J	2.0 U	0.40 J
Arsenic	µg/L	10	0.045	-	-	6.9 U	10	2.7	2.5	2.6	1.6
Barium	µg/L	2000	7300	-	-	75	2000	77.8 J	75.9 J	166 J	115 J
Beryllium	µg/L	4	73	-	-	3.1 BJ	4	1.0 U	1.0 U	0.63 J	1.0 U
Cadmium	µg/L	5	18	-	-	4.6 UJ	5	1.0 U	1.0 U	1.0 U	1.0 U
Calcium	µg/L	-	-	250000	-	275000	275000	28400	28100	253000	355000
Chromium	µg/L	100	-	-	-	1180	1180	22.5	18.6	17.6	6.0 J
Cobalt	µg/L	-	11	-	-	50 U	50 U	4.3 J	3.0 J	4.0 J	2.5 J
Copper	µg/L	1300	1500	-	1000	50.6	1300	23.9 J	16.4 J	13.8 J	25.0 U
Iron	µg/L	-	26000	-	300	7720	26000	6830	6350	8040	2910
Lead	µg/L	15	-	-	-	3.0 U	15	9.6	9.9	5.5	3.0 U
Magnesium	µg/L	-	-	-	-	-	-	3450 J	3330 J	8730	16000
Manganese	µg/L	-	880	-	50	712	880	59.7	56.0	316	143
Mercury	µg/L	2	0.57	-		0.2 U	2	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	µg/L	-	-	-	-	-	-	23.8 J	19.6 J	17.5 J	6.2 J
Potassium	µg/L	-	-	-	-	-	-	1950 J	1880 J	4000 Ja	5210a
Selenium	µg/L	50	180	-	-	6.0 UJ	50	5.0 U	5.0 U	5.0 U	5.0 U
Silver	µg/L	-	180	-	-	19.5	19.5	10.0 U	10.0 U	10.0 U	10.0 U
Sodium	µg/L	-	-	150000	-	106000	150000	4650 J	4000 J	16900	22500
Thallium	µg/L	2	-	-	-	12.35	12.35	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	µg/L	-	2.6	-	-	50 U	50 U	30.4 J	27.7 J	26.3 J	10.0 J
Zinc	µg/L	-	11000	-	5000	34.1 U	11000	59.6 U	57.2 U	43.2	23.0 U
General Chemistry											
Bromide	mg/L	-	-	-	-	-	-	0.50 U	0.50 U	0.30 J	0.40 J
Chloride	mg/L	-	-	-	250	258	258	1.6	1.6	10.1	13.1
Cyanide (total)	mg/L	0.2	-	-	-	0.01 U	0.2	0.010 U	0.010 U	0.010 U	0.0052 J
Sulfate	mg/L	-	-	-	250	965	965	10.9	11.1	238	314

Notes:

J	Estimated.
-	Not applicable.
MCL	Maximum Contaminant Level.
RDA	Recommended Daily Allowance.
BV	Background Value.
GW RAO	Groundwater Remedial Action Objective.

TABLE 5.6

WT115A METAL AND GENERAL CHEMISTRY RESULTS SUMMARY
HIMCO
ELKHART, INDIANA

Parameters	*Units*	*Primary MCL*	*RSL Tapwater*	*RDA*	*Secondary MCL*	*BV*	*GW RAO*	*WT115A GW-WT115A-110609-D 11/6/2009 Duplicate*	*WT115A GW-WT115A-030210 3/2/2010*	*WT115A GW-WT115A-061710 6/17/2010*	*WT115A GW-WT115A-091510 9/15/2010*
Metals											
Aluminum	μg/L	-	37000	-	50	860	37000	4060	10500	36300	27500
Antimony	μg/L	6	15	-	-	42.2 UJ	42.2 UJ	0.42 J	0.22 J	0.26 J	0.40 J
Arsenic	μg/L	10	0.045	-	-	6.9 U	10	1.6	1.9	2.7	4.1
Barium	μg/L	2000	7300	-	-	75	2000	113 J	126 J	155 J	216
Beryllium	μg/L	4	73	-	-	3.1 BJ	4	1.0 U	1.0 U	0.94 J	1.0 U
Cadmium	μg/L	5	18	-	-	4.6 UJ	5	1.0 U	1.0 U	1.0 U	1.0 U
Calcium	μg/L	-	-	250000	-	275000	275000	347000	271000	48100	260000
Chromium	μg/L	100	-	-	-	1180	1180	6.0 J	10.5	35.6	28.8
Cobalt	μg/L	-	11	-	-	50 U	50 U	2.0 J	2.8 J	6.7 J	6.0 J
Copper	μg/L	1300	1500	-	1000	50.6	1300	25.0 U	9.0 J	38.5	33.1
Iron	μg/L	-	26000	-	300	7720	26000	4230	5720 J	13800	12000
Lead	μg/L	15	-	-	-	3.0 U	15	3.0 U	4.0	15.8	10.5
Magnesium	μg/L	-	-	-	-	-	-	15700	9450	5100	11700
Manganese	μg/L	-	880	-	50	712	880	146	139	116	274
Mercury	μg/L	2	0.57	-		0.2 U	2	0.20 U	0.20 U	0.19 J	0.20 U
Nickel	μg/L	-	-	-	-	-	-	5.0 J	11.6 J	36.1 J	30.7 J
Potassium	μg/L	-	-	-	-	-	-	5100a	4620 Ja	2420 J	7150a
Selenium	μg/L	50	180	-	-	6.0 UJ	50	5.0 U	5.0 U	4.5 J	5.0 U
Silver	μg/L	-	180	-	-	19.5	19.5	10.0 U	10.0 U	10.0 U	10.0 U
Sodium	μg/L	-	-	150000	-	106000	150000	22200	18600	6620	26800
Thallium	μg/L	2	-	-	-	12.35	12.35	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	μg/L	-	2.6	-	-	50 U	50 U	10.2 J	17.2 J	46.7 J	42.4 J
Zinc	μg/L	-	11000	-	5000	34.1 U	11000	20.0 U	39.9	86.2	80.3
General Chemistry											
Bromide	mg/L	-	-	-	-	-	-	0.40 J	0.40 J	0.50 U	0.48 J
Chloride	mg/L	-	-	-	250	258	258	12.9	15.7	3.7	19.5
Cyanide (total)	mg/L	0.2	-	-	-	0.01 U	0.2	0.010 U	0.010 U	0.010 U	0.010 U
Sulfate	mg/L	-	-	-	250	965	965	310	232	35.7	191

Notes:

J	Estimated.
-	Not applicable.
MCL	Maximum Contaminant Level.
RDA	Recommended Daily Allowance.
BV	Background Value.
GW RAO	Groundwater Remedial Action Objective.

TABLE 6.1

SUMMARY OF GROUNDWATER REMEDIAL ACTION OBJECTIVE EXCEEDANCES
HIMCO SITE
ELKHART, INDIANA

Well	*Benzene*	*Arsenic*	*Lead*	*Iron*	*Calcium*	*Sodium*	*Manganese*	*Sulfate*
UPPER AQUIFER WELLS								
On-Site Wells								
WT101A	0%	0%	0%	88%	75%	0%	100%	0%
WT103A	0%	0%	0%	0%	0%	0%	0%	0%
WT111A	0%	0%	0%	0%	0%	0%	0%	0%
WT115A	73%	18%	36%	27%	37%	0%	0%	0%
WT116A	0%	0%	0%	20%	100%	60%	0%	60%
WT117A	0%	0%	0%	0%	0%	0%	0%	0%
WT117C	0%	0%	0%	0%	0%	0%	0%	0%
WT119B	0%	0%	0%	0%	0%	0%	0%	0%
WTO2	0%	0%	0%	0%	0%	0%	0%	0%
Off-Site Wells								
WT102A	0%	0%	0%	0%	0%	0%	0%	0%
WT104A	0%	0%	0%	0%	0%	0%	0%	0%
WT105A	0%	0%	0%	0%	0%	0%	0%	0%
WT106A	0%	13%	0%	13%	0%	0%	13%	0%
WT112A	0%	0%	0%	0%	57%	0%	0%	0%
WT113A	0%	0%	0%	0%	0%	0%	0%	0%
WT114A	0%	0%	0%	0%	0%	100%	0%	0%
INTERMEDIATE AQUIFER WELLS								
On-Site Wells								
WT101B	0%	0%	0%	0%	0%	0%	0%	0%
WT101D	0%	0%	0%	0%	0%	0%	0%	0%
WT101E	0%	0%	0%	0%	0%	0%	0%	0%
WT113B	0%	0%	0%	0%	0%	0%	0%	0%
WT116B	0%	0%	0%	0%	0%	0%	0%	0%
WT117B	0%	0%	0%	0%	0%	0%	0%	0%
WT117D	0%	0%	0%	0%	0%	0%	0%	0%
WT118B	0%	0%	0%	0%	0%	0%	0%	0%
WTB3	0%	0%	0%	0%	0%	0%	0%	0%
WTE1	0%	0%	0%	0%	0%	0%	0%	0%
WTO3	0%	0%	0%	0%	0%	0%	0%	0%
WTO4	0%	0%	0%	0%	0%	0%	0%	0%
Off-Site Wells								
WT102B	0%	0%	0%	0%	0%	0%	0%	0%
WT106B	0%	100%	0%	0%	0%	0%	0%	0%
WT112B	0%	0%	0%	0%	0%	0%	0%	0%
WT114B	0%	0%	0%	0%	0%	0%	0%	0%
WT114C	0%	50%	0%	0%	0%	0%	0%	0%
WT120A	0%	0%	0%	0%	0%	0%	0%	0%
WT120B	0%	50%	0%	0%	0%	0%	0%	0%
LOWER AQUIFER WELLS								
On-Site Wells								
WT101C	0%	0%	0%	0%	0%	0%	0%	0%
WTB1	0%	0%	0%	0%	0%	0%	0%	0%
WTB4	0%	0%	0%	0%	0%	0%	0%	0%
WTE3	0%	0%	0%	0%	0%	0%	0%	0%
Off-Site Wells								
WT102C	0%	0%	0%	0%	0%	0%	0%	0%

TABLE 6.2

GROUNDWATER MONITORING PROGRAM WELLS
HIMCO SITE
ELKHART, INDIANA

UPPER AQUIFER WELLS

Detection Monitoring Wells

Well	Rationale
WT101A	iron and manganese routinely exceed GW RAOs and calcium often exceeds GWRAO
WT115A	benzene routinely exceeds GW RAO: arsenic, lead, iron and calcium occasionally exceeds GWRAO
WT116A	calcium routinely exceeds GW RAO and sodium and sulfate routinely exceed GWRAO

Compliance Monitoring Wells

Well	Rationale
WT106A	down gradient of iron and calcium at WT101A
WT111A	cross gradient of iron and calcium at WT101A
WT114A	cross gradient of iron and calcium at WT101A
WT115B	vertical delineation of benzene at WT115A
WT119B	down gradient of calcium at WT116A
WT120C	cross gradient of iron and calcium at WT101A
WT121A	down gradient of iron and calcium at WT101A
WT122A	down gradient of benzene at WT115A

Background Monitoring Well

WT102A

INTERMEDIATE AQUIFER WELLS

Detection Monitoring Wells

Well	Rationale
WT106B	arsenic routinely exceeds the GW RAO
WT114C	arsenic occasionally exceeds the GW RAO
WT120B	arsenic occasionally exceeds the GW RAO

Compliance Monitoring Wells

Well	Rationale
WT101D	vertical delineation of iron and calcium at WT101A
WT101E	vertical delineation of iron and calcium at WT101A
WT114B	vertical delineation of arsenic at WT114C
WT120A	vertical delineation of arsenic at WT120B
WT121B	downgradient of arsenic at WT120B

Background Monitoring Well

WT102B

TABLE 6.3

GROUNDWATER MONITORING PROGRAM PARAMETER LIST
HIMCO SITE
ELKHART, INDIANA

Volatile Organic Compounds
Benzene

Metals
Arsenic
Calcium
Iron
Lead
Manganese
Sodium

General Chemistry
Sulfate
Chloride

TABLE 6.4

GROUNDWATER MONITORING PROGRAM - GROUNDWATER ELEVATION MONITORING
HIMCO SITE
ELKHART, INDIANA

WT101A	WT113B[(1)]	WT120C
WT101B	WT114A	WT121A
WT101C	WT114B	WT121B
WT101D	WT114C	WT122A
WT101E	WT115A	WT122B
WT102A[(1)]	WT115B	WT122C
WT102B[(1)]	WT115C	WTB1
WT102C[(1)]	WT116A	WTB3
WT103A	WT116B	WTB4
WT104A	WT117A	WTE1
WT106A	WT117B	WTE3
WT106B	WT117C	WTO2
WT106C	WT117D	WTO3
WT111A	WT118B	WTO4
WT112A[(1)]	WT119B	SW1
WT112B[(1)]	WT120A	SW2
WT113A[(1)]	WT120B	SW3

Note:

(1) Property owner withdrew permission to access the well. Groundwater elevations will be measured if access can be obtained.

APPENDIX A

e:DAT (ELECTRONIC DATA ACCESS TOOL)

APPENDIX B

TABLE OF ANALYTICAL RESULTS

TABLE B.1

GROUNDWATER SAMPLING RESULTS- VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:			WT101A	WT101B	WT101B	WT101C	WT101D	WT101E	WT103A	WT104A	WT105A
Sample ID:			GW-WT101A-091410	GW-WT101B-091410	GW-WT101B-091410-D	GW-WT101C-091410	GW-WT101D-091410	GW-WT101E-091410	GW-WT103A-091510	GW-WT104A-090810	GW-WT105A-090810
Sample Date:			9/14/2010	9/14/2010	9/14/2010	9/14/2010	9/14/2010	9/14/2010	9/15/2010	9/8/2010	9/8/2010
		USEPA			*Duplicate*						
Parameters	*Units*	*Primary MCL*									
Volatile Organic Compounds											
1,1,1-Trichloroethane	µg/L	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	-	4.9	0.77 J	0.75 J	1.0 U	3.9	3.2	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	70	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.2	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	0.05	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	75	1.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	-	10 U	8.4 J	8.6 J	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	-	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	-	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	µg/L	-	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	µg/L	5	3.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	µg/L	-	0.34 J	1.1	0.65 J	1.0 U	1.0 U	1.0 U	0.62 J	1.0 U	1.0 U
Carbon tetrachloride	µg/L	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	100	0.45 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	-	2.3	1.6	1.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	70	0.41 J	1.0 U	1.0 U	1.0 U	0.40 J	0.23 J	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	-	0.53 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	-	0.48 J	1.0 U	1.0 U	1.0 U	0.44 J	0.57 J	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	µg/L	-	0.27 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	µg/L	-	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	µg/L	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	µg/L	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	µg/L	100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	2	0.42 J	0.85 J	0.76 J	1.0 U	1.0 U	0.42 J	1.0 U	1.0 U	1.0 U
Xylenes (total)	µg/L	10000	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Notes:

J Value is estimated.
U Not present at or above the associated value.
* The total concentration of Trihalomethanes (Bromoform, Bromodichloromethane, Dibromochloromethane and Chloroform) cannot exceed 80 µg/L.
\- Not applicable.

CRA 039611 (30)

TABLE B.1

GROUNDWATER SAMPLING RESULTS- VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		WT106A	WT106B	WT111A	WT114A	WT114B	WT114C	WT115A	WT116A	WT116B	WT117A
Sample ID:		GW-WT106A-090910	GW-WT106B-090910	GW-WT111A-091010	GW-WT114A-090910	GW-WT114B-090910	GW-WT114C-090910	GW-WT115A-091510	GW-WT116A-091510	GW-WT116B-091510	GW-WT117A-090810
Sample Date:		9/9/2010	9/9/2010	9/10/2010	9/9/2010	9/9/2010	9/9/2010	9/15/2010	9/15/2010	9/15/2010	9/8/2010
Parameters	*Units*										
Volatile Organic Compounds											
1,1,1-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	1.6	1.0 U	4.2	1.0 U	1.6	4.7	2.8	5.7	1.0 U	0.26 J
1,1-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	1.0 U	1.0 U	0.18 J	1.0 U	0.41 J	1.0 U	0.18 J	0.51 J	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.31 J	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	µg/L	0.24 J	1.0 U	0.66 J	1.0 U	1.0 U	1.0 U	$\boxed{10^{*}}$	2.1	1.0 U	1.0 U
Bromodichloromethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	µg/L	1.0 U	0.17 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	1.0 U	2.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1	0.60 J	1.0 U
Chloroform (Trichloromethane)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	0.60 J	1.0 U	0.68 J	1.0 U	0.52 J	1.0 U	0.35 J	0.57 J	1.0 U	1.0 U
cis-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U	1.0 U	0.40 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	1.0 U	1.0	0.36 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.56 J	1.0 U
Xylenes (total)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Notes:

J Value is estimated.
U Not present at or above the associated value.
* The total concentration of Trihalomethanes (Bromoform, Bromodichloromethane, Dibromochloromethane and Chloroform) cannot exceed 80 µg/L.
\- Not applicable.

TABLE B.1

GROUNDWATER SAMPLING RESULTS- VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		*WT117B*	*WT117C*	*WT117C*	*WT117D*	*WT118B*	*WT119B*	*WT120A*	*WT120B*	*WTB1*	*WTB3*
Sample ID:		*GW-WT117B-090810*	*GW-WT117C-090810*	*GW-WT117C-090810-D*	*GW-WT117D-090810*	*GW-WT118B-091010*	*GW-WT119B-091510*	*GW-WT120A-090910*	*GW-WT120B-090910*	*GW-WTB1-091510*	*GW-WTB3-091510*
Sample Date:		*9/8/2010*	*9/8/2010*	*9/8/2010*	*9/8/2010*	*9/10/2010*	*9/15/2010*	*9/9/2010*	*9/9/2010*	*9/15/2010*	*9/15/2010*
				Duplicate							
Parameters	*Units*										
Volatile Organic Compounds											
1,1,1-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	3.4	5.0	5.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	µg/L	0.79 J	0.64 J	0.61 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.13 J	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.63 J	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	0.38 J	0.99 J	0.91 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U	0.56 J	0.56 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	0.57 J	1.5	1.5	1.0 U	0.54 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Notes:

J	Value is estimated.
U	Not present at or above the associated value.
*	The total concentration of Trihalomethanes (Bromoform, Bromodichloromethane, Dibromochloromethane and Chloroform) cannot exceed 80 µg/L.
-	Not applicable.

TABLE B.1

GROUNDWATER SAMPLING RESULTS- VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		*WTB4*	*WTE1*	*WTE3*	*WTO2*	*WTO3*	*WTO4*
Sample ID:		*GW-WTB4-091510*	*GW-WTE1-091410*	*GW-WTE3-091410*	*GW-WTO2-091310*	*GW-WTO3-091310*	*GW-WTO4-091310*
Sample Date:		*9/15/2010*	*9/14/2010*	*9/14/2010*	*9/13/2010*	*9/13/2010*	*9/13/2010*
Parameters	*Units*						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	10 U	10 U	5.7 J	10 U	10 U	0.58 J
2-Hexanone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	µg/L	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	µg/L	0.30 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	1.0 U	1.0 U	1.4	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	µg/L	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	0.65 J	0.70 J	0.90 J	1.0 U	1.0 U	1.0 U
Xylenes (total)	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Notes:

J	Value is estimated.
U	Not present at or above the associated value.
*	The total concentration of Trihalomethanes (Bromoform, Bromodichloromethane, Dibromochloromethane and Chloroform) cannot exceed 80 µg/L.
-	Not applicable.

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TABLE B.2

GROUNDWATER SAMPLING RESULTS- SEMI-VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:			*WT101A*	*WT101B*	*WT101B*	*WT101C*	*WT101D*	*WT101E*	*WT103A*	*WT104A*	*WT105A*
Sample ID:			*GW-WT101A-091410*	*GW-WT101B-091410*	*GW-WT101B-091410-D*	*GW-WT101C-091410*	*GW-WT101D-091410*	*GW-WT101E-091410*	*GW-WT103A-091510*	*GW-WT104A-090810*	*GW-WT105A-090810*
Sample Date:			*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/15/2010*	*9/8/2010*	*9/8/2010*
		USEPA			*Duplicate*						
Parameters	*Units*	*Primary MCL*									
Semivolatile Organic Compounds											
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2,4,5-Trichlorophenol	µg/L	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,6-Trichlorophenol	µg/L	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dichlorophenol	µg/L	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dimethylphenol	µg/L	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dinitrophenol	µg/L	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dinitrotoluene	µg/L	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,6-Dinitrotoluene	µg/L	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Chloronaphthalene	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorophenol	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Methylnaphthalene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylphenol	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Nitroaniline	µg/L	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2-Nitrophenol	µg/L	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
3,3'-Dichlorobenzidine	µg/L	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
3-Nitroaniline	µg/L	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4,6-Dinitro-2-methylphenol	µg/L	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Bromophenyl phenyl ether	µg/L	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloro-3-methylphenol	µg/L	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloroaniline	µg/L	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chlorophenyl phenyl ether	µg/L	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Methylphenol	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Nitroaniline	µg/L	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Nitrophenol	µg/L	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acenaphthene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acenaphthylene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acetophenone	µg/L	-	1.0 U	2.3	1.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Atrazine	µg/L	3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzaldehyde	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)anthracene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(a)pyrene	µg/L	0.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(b)fluoranthene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(g,h,i)perylene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(k)fluoranthene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Biphenyl (1,1-Biphenyl)	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethoxy)methane	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethyl)ether	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	6	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Butyl benzylphthalate (BBP)	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Caprolactam	µg/L	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbazole	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chrysene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenz(a,h)anthracene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenzofuran	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Diethyl phthalate	µg/L	-	3.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dimethyl phthalate	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-butylphthalate (DBP)	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-octyl phthalate (DnOP)	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

TABLE B.2

GROUNDWATER SAMPLING RESULTS- SEMI-VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:			*WT101A*	*WT101B*	*WT101B*	*WT101C*	*WT101D*	*WT101E*	*WT103A*	*WT104A*	*WT105A*
Sample ID:			*GW-WT101A-091410*	*GW-WT101B-091410*	*GW-WT101B-091410-D*	*GW-WT101C-091410*	*GW-WT101D-091410*	*GW-WT101E-091410*	*GW-WT103A-091510*	*GW-WT104A-090810*	*GW-WT105A-090810*
Sample Date:			*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/15/2010*	*9/8/2010*	*9/8/2010*
		USEPA			*Duplicate*						
Parameters	*Units*	*Primary MCL*									
Fluorene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobenzene	µg/L	1	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobutadiene	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorocyclopentadiene	µg/L	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Indeno(1,2,3-cd)pyrene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Isophorone	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nitrobenzene	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodi-n-propylamine	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodiphenylamine	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pentachlorophenol	µg/L	1	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Phenol	µg/L	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.3	1.0 U	1.0 U	1.0 U
Pyrene	µg/L	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

Notes:

J	Value is estimated.
U	Not present at or above the associated value.
UJ	The parameter was not detected above the sample reporting limit. The sample reporting limit is estimated.
-	Not applicable.

TABLE B.2

GROUNDWATER SAMPLING RESULTS- SEMI-VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		WT106A	WT106B	WT111A	WT114A	WT114B	WT114C	WT115A	WT116A	WT116B	WT117A
Sample ID:		GW-WT106A-090910	GW-WT106B-090910	GW-WT111A-091010	GW-WT114A-090910	GW-WT114B-090910	GW-WT114C-090910	GW-WT115A-091510	GW-WT116A-091510	GW-WT116B-091510	GW-WT117A-090810
Sample Date:		9/9/2010	9/9/2010	9/10/2010	9/9/2010	9/9/2010	9/9/2010	9/15/2010	9/15/2010	9/15/2010	9/8/2010
Parameters	*Units*										
Semivolatile Organic Compounds											
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2,4,5-Trichlorophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,6-Trichlorophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dichlorophenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dimethylphenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dinitrophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dinitrotoluene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,6-Dinitrotoluene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Chloronaphthalene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorophenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Methylnaphthalene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylphenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Nitroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2-Nitrophenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
3,3'-Dichlorobenzidine	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
3-Nitroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4,6-Dinitro-2-methylphenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Bromophenyl phenyl ether	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloro-3-methylphenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chlorophenyl phenyl ether	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Methylphenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Nitroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Nitrophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acenaphthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acenaphthylene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acetophenone	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Atrazine	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzaldehyde	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)anthracene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(a)pyrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(b)fluoranthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(g,h,i)perylene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(k)fluoranthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Biphenyl (1,1-Biphenyl)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethoxy)methane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethyl)ether	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	1.1 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.98 J
Butyl benzylphthalate (BBP)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Caprolactam	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbazole	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chrysene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenz(a,h)anthracene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenzofuran	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Diethyl phthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dimethyl phthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-butylphthalate (DBP)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U
Di-n-octyl phthalate (DnOP)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

TABLE B.2

GROUNDWATER SAMPLING RESULTS- SEMI-VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		*WT106A*	*WT106B*	*WT111A*	*WT114A*	*WT114B*	*WT114C*	*WT115A*	*WT116A*	*WT116B*	*WT117A*
Sample ID:		*GW-WT106A-090910*	*GW-WT106B-090910*	*GW-WT111A-091010*	*GW-WT114A-090910*	*GW-WT114B-090910*	*GW-WT114C-090910*	*GW-WT115A-091510*	*GW-WT116A-091510*	*GW-WT116B-091510*	*GW-WT117A-090810*
Sample Date:		*9/9/2010*	*9/9/2010*	*9/10/2010*	*9/9/2010*	*9/9/2010*	*9/9/2010*	*9/15/2010*	*9/15/2010*	*9/15/2010*	*9/8/2010*
Parameters	*Units*										
Fluorene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobenzene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobutadiene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorocyclopentadiene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Indeno(1,2,3-cd)pyrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Isophorone	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nitrobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodi-n-propylamine	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodiphenylamine	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pentachlorophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Phenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pyrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

Notes:

J	Value is estimated.
U	Not present at or above the associated value.
UJ	The parameter was not detected above the sample reporting limit. The reporting limit is estimated.
-	Not applicable.

TABLE B.2

GROUNDWATER SAMPLING RESULTS- SEMI-VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		WT117B	WT117C	WT117C	WT117D	WT118B	WT119B	WT120A	WT120B	WTB1	WTB3
Sample ID:		GW-WT117B-090810	GW-WT117C-090810	GW-WT117C-090810-D	GW-WT117D-090810	GW-WT118B-091010	GW-WT119B-091510	GW-WT120A-090910	GW-WT120B-090910	GW-WTB1-091510	GW-WTB3-091510
Sample Date:		9/8/2010	9/8/2010	9/8/2010	9/8/2010	9/10/2010	9/15/2010	9/9/2010	9/9/2010	9/15/2010	9/15/2010
				Duplicate							
Parameters	*Units*										
Semivolatile Organic Compounds											
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2,4,5-Trichlorophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,6-Trichlorophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dichlorophenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dimethylphenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dinitrophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dinitrotoluene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,6-Dinitrotoluene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Chloronaphthalene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorophenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Methylnaphthalene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylphenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Nitroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2-Nitrophenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
3,3'-Dichlorobenzidine	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
3-Nitroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4,6-Dinitro-2-methylphenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Bromophenyl phenyl ether	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloro-3-methylphenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chlorophenyl phenyl ether	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Methylphenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Nitroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Nitrophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acenaphthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acenaphthylene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acetophenone	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Atrazine	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzaldehyde	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)anthracene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(a)pyrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(b)fluoranthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(g,h,i)perylene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.22	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(k)fluoranthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.28	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Biphenyl (1,1-Biphenyl)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethoxy)methane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethyl)ether	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	1.2 J	0.90 J	1.3 J	2.0 U	1.4 J	2.0 U	2.0 U	0.86 J	2.0 U	2.0 U
Butyl benzylphthalate (BBP)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Caprolactam	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbazole	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chrysene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.25	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenz(a,h)anthracene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.26	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenzofuran	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Diethyl phthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dimethyl phthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-butylphthalate (DBP)	µg/L	1.6 U	1.3 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-octyl phthalate (DnOP)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

TABLE B.2

GROUNDWATER SAMPLING RESULTS- SEMI-VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		*WT117B*	*WT117C*	*WT117C*	*WT117D*	*WT118B*	*WT119B*	*WT120A*	*WT120B*	*WTB1*	*WTB3*
Sample ID:		*GW-WT117B-090810*	*GW-WT117C-090810*	*GW-WT117C-090810-D*	*GW-WT117D-090810*	*GW-WT118B-091010*	*GW-WT119B-091510*	*GW-WT120A-090910*	*GW-WT120B-090910*	*GW-WTB1-091510*	*GW-WTB3-091510*
Sample Date:		*9/8/2010*	*9/8/2010*	*9/8/2010*	*9/8/2010*	*9/10/2010*	*9/15/2010*	*9/9/2010*	*9/9/2010*	*9/15/2010*	*9/15/2010*
				Duplicate							
Parameters	*Units*										
Fluorene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobenzene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobutadiene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorocyclopentadiene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Indeno(1,2,3-cd)pyrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.21	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Isophorone	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nitrobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodi-n-propylamine	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodiphenylamine	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pentachlorophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Phenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.2	1.0 U	1.0 U	1.0 U	1.0 U
Pyrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

Notes:

J	Value is estimated.
U	Not present at or above the associated value.
UJ	The parameter was not detected above the sample reporting limit. The reporting limit is estimated.
-	Not applicable

TABLE B.2

GROUNDWATER SAMPLING RESULTS- SEMI-VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		*WTB4*	*WTE1*	*WTE3*	*WTO2*	*WTO3*	*WTO4*
Sample ID:		*GW-WTB4-091510*	*GW-WTE1-091410*	*GW-WTE3-091410*	*GW-WTO2-091310*	*GW-WTO3-091310*	*GW-WTO4-091310*
Sample Date:		*9/15/2010*	*9/14/2010*	*9/14/2010*	*9/13/2010*	*9/13/2010*	*9/13/2010*
Parameters	*Units*						
Semivolatile Organic Compounds							
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2,4,5-Trichlorophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,6-Trichlorophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dichlorophenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dimethylphenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dinitrophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dinitrotoluene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,6-Dinitrotoluene	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Chloronaphthalene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorophenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Methylnaphthalene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylphenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Nitroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2-Nitrophenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
3,3'-Dichlorobenzidine	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
3-Nitroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4,6-Dinitro-2-methylphenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Bromophenyl phenyl ether	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloro-3-methylphenol	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Chlorophenyl phenyl ether	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Methylphenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Nitroaniline	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Nitrophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acenaphthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acenaphthylene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acetophenone	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Atrazine	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzaldehyde	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)anthracene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(a)pyrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(b)fluoranthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(g,h,i)perylene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(k)fluoranthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Biphenyl (1,1-Biphenyl)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethoxy)methane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethyl)ether	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	3.0	2.0 U	1.1 J	2.0 U	2.0 U	2.0 U
Butyl benzylphthalate (BBP)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	0.82 J	1.0 U
Caprolactam	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbazole	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chrysene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenz(a,h)anthracene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenzofuran	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Diethyl phthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dimethyl phthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-butylphthalate (DBP)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-octyl phthalate (DnOP)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

TABLE B.2

GROUNDWATER SAMPLING RESULTS- SEMI-VOLATILE ORGANIC COMPOUNDS
HIMCO SITE
ELKHART, INDIANA

Sample Location:		*WTB4*	*WTE1*	*WTE3*	*WTO2*	*WTO3*	*WTO4*
Sample ID:		*GW-WTB4-091510*	*GW-WTE1-091410*	*GW-WTE3-091410*	*GW-WTO2-091310*	*GW-WTO3-091310*	*GW-WTO4-091310*
Sample Date:		*9/15/2010*	*9/14/2010*	*9/14/2010*	*9/13/2010*	*9/13/2010*	*9/13/2010*
Parameters	*Units*						
Fluorene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobenzene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobutadiene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorocyclopentadiene	µg/L	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Indeno(1,2,3-cd)pyrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Isophorone	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nitrobenzene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodi-n-propylamine	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodiphenylamine	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pentachlorophenol	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Phenol	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pyrene	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

Notes:

J	Value is estimated.
U	Not present at or above the associated value
UJ	The parameter was not detected above the sample reporting limit. The reporting limit is estimated.
-	Not applicable.

TABLE B.3

GROUNDWATER SAMPLING RESULTS - METALS AND GENERAL CHEMISTRY
HIMCO SITE
ELKHART, INDIANA

Sample Location:					*WT101A*	*WT101B*	*WT101B*	*WT101C*	*WT101D*	*WT101E*	*WT103A*	*WT104A*
Sample ID:					GW-WT101A-091410	GW-WT101B-091410	GW-WT101B-091410-D	GW-WT101C-091410	GW-WT101D-091410	GW-WT101E-091410	GW-WT103A-091510	GW-WT104A-090810
Sample Date:					*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/15/2010*	*9/8/2010*
		USEPA	*USEPA*	*RDA*			*Duplicate*					
Parameters	*Units*	*Primary MCL*	*Secondary MCL*	*Criteria*								
		a	*b*	*c*								
Metals												
Aluminum	µg/L	-	50	-	19.3 J	50.0 U	50.0 U	**61.7[b]**	50.0 U	50.0 U	**149[b]**	50.0 U
Antimony	µg/L	6	-	-	2.0 U	0.38 J	0.38 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	µg/L	10	-	-	8.0	0.82 J	0.69 J	8.2	0.86 J	4.0	2.6	1.0 U
Barium	µg/L	2000	-	-	72 3 J	67.2 J	62.7 J	81.4 J	50.7 J	42.9 J	66.6 J	200 U
Beryllium	µg/L	4	-	-	0.52 J	0.52 J	0.50 J	0.49 J	0.51 J	0.51 J	0.70 J	1.0 U
Cadmium	µg/L	5	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Calcium	µg/L	-	-	250000	**281000[c]**	80500	75800	50400	94700	95000	127000	25100
Chromium	µg/L	100	-	-	10.0 U	6.3 J	5.6 J	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Cobalt	µg/L	-	-	-	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
Copper	µg/L	1300	1000	-	25 0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	5.6 J	25.0 U
Iron	µg/L	-	300	1000	**21100[bc]**	**646[b]**	**577[b]**	**974[b]**	**2040[bc]**	**3760[bc]**	**2570[bc]**	100 U
Lead	µg/L	15	-	-	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Magnesium	µg/L	-	-	-	16400	42300	39800	21100	19900	13800	21400	6140
Manganese	µg/L	-	50	-	**1120[b]**	35.4	33.4	12.0 J	**55.6[b]**	47.5	**279[b]**	15.0 U
Mercury	µg/L	2	-	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	µg/L	-	-	-	40.0 U	3.6 J	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U
Potassium	µg/L	-	-	-	5790	38400	36700	3090 J	1400 J	4100 J	3360 J	1100 J
Selenium	µg/L	50	-	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Silver	µg/L	-	100	-	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Sodium	µg/L	-	-	150000	21200	35700	33700	21100	19500	15600	18200	3510 J
Thallium	µg/L	2	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	µg/L	-	-	-	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
Zinc	µg/L	-	5000	-	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U
General Chemistry												
Bromide	mg/L	-	-	-	0.14 J	0.16 J	0.14 J	0.16 J	0.50 U	0.50 U	0.50 U	0.50 U
Chloride	mg/L	-	250	-	27.2	28.7	28.7	2.6	36.5	32.7	31.4	2.6
Cyanide (total)	mg/L	0.2	-	-	0.010 U	0.097	0.094	0.010 U	0 010 U	0.010 U	0.010 U	0.010 U
Sulfate	mg/L	-	250	-	**342[b]**	30.9	31.9	1.2	102	113	**267[b]**	10.7

Notes:

J	Value is estimated.
U	Not present at or above the associated value.
*	Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L and for lead, the action level is 0.015 mg/L The action level is discussed herein because there is no primary MCL for lead. The action level applies to public water treatment facilities, and is included herein for discussion purposes only
-	Not applicable.
326000[c]	Concentration greater than criteria indicated.

CRA 039611 (30)

TABLE B.3

GROUNDWATER SAMPLING RESULTS - METALS AND GENERAL CHEMISTRY
HIMCO SITE
ELKHART, INDIANA

Sample Location:					*WT105A*	*WT106A*	*WT106B*	*WT111A*	*WT114A*	*WT114B*	*WT114C*	*WT115A*
Sample ID:					*GW-WT105A-090810*	*GW-WT106A-090910*	*GW-WT106B-090910*	*GW-WT111A-091010*	*GW-WT114A-090910*	*GW-WT114B-090910*	*GW-WT114C-090910*	*GW-WT115A-091510*
Sample Date:					*9/8/2010*	*9/9/2010*	*9/9/2010*	*9/10/2010*	*9/9/2010*	*9/9/2010*	*9/9/2010*	*9/15/2010*
Parameters	*Units*	*USEPA Primary MCL a*	*USEPA Secondary MCL b*	*RDA Criteria c*								
Metals												
Aluminum	µg/L	-	50	-	50.0 U	40.8 J	25.3 J	**155[b]**	50.0 U	50.0 U	50.0 U	**27500[b]**
Antimony	µg/L	6	-	-	2.0 U	2.0 U	2.0 U	0.19 J	2.0 U	2.0 U	2.0 U	0.40 J
Arsenic	µg/L	10	-	-	1.0 U	4.8	**11.6[a]**	6.6	2.1	7.5	**20.4[a]**	4.1
Barium	µg/L	2000	-	-	15.8 J	53.6 J	104 J	91.6 J	104 J	42.2 J	67.3 J	216
Beryllium	µg/L	4	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	µg/L	5	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Calcium	µg/L	-	-	250000	63700	140000	144000	**263000[c]**	107000	78000	78300	**260000[c]**
Chromium	µg/L	100	-	-	7.4 J	12.6	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	28.8
Cobalt	µg/L	-	-	-	50.0 U	2.2 J	50.0 U	2.6 J	50.0 U	50.0 U	50.0 U	6.0 J
Copper	µg/L	1300	1000	-	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	33.1
Iron	µg/L	-	300	1000	124	**2780[bc]**	**5550[bc]**	**3540[bc]**	**1430[bc]**	**2160[bc]**	**2950[bc]**	**12000[bc]**
Lead	µg/L	15	-	-	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	10.5
Magnesium	µg/L	-	-	-	13900	16800	63900	19900	19600	18000	15800	11700
Manganese	µg/L	-	50	-	**73.4[b]**	**683[b]**	46.3	**746[b]**	**182[b]**	37.7	38.8	**274[b]**
Mercury	µg/L	2	-	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	µg/L	-	-	-	6.9 J	9.0 J	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	30.7 J
Potassium	µg/L	-	-	-	1670 J	2080 J	5470	3890 J	2820 J	1270 J	1900 J	7150
Selenium	µg/L	50	-	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Silver	µg/L	-	100	-	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Sodium	µg/L	-	-	150000	6790	25100	40400	39300	**353000[c]**	22200	14000	26800
Thallium	µg/L	2	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	µg/L	-	-	-	50.0 U	50.0 U	50.0 U	4.5 J	50.0 U	50.0 U	50.0 U	42.4 J
Zinc	µg/L	-	5000	-	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	80.3
General Chemistry												
Bromide	mg/L	-	-	-	0.50 U	0.25 J	0.26 J	0.62	0.50 U	0.50 U	0.50 U	0.48 J
Chloride	mg/L	-	250	-	5.5	48.0	26.3	26.9	**597[b]**	42.4	23.0	19.5
Cyanide (total)	mg/L	0.2	-	-	0.010 U	0.0065 J	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Sulfate	mg/L	-	250	-	14.9	130	221	**361[b]**	64.6	76.9	81.9	191

Notes.

J Value is estimated.
U Not present at or above the associated value.
* Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water.
If more than 10% of tap water samples exceed the action level, water systems must take additional steps.
For copper, the action level is 1.3 mg/L and for lead, the action level is 0.015 mg/L.
The action level is discussed herein because there is no primary MCL for lead.
The action level applies to public water treatment facilities, and is included herein for discussion purposes only.
\- Not applicable.
326000[c] Concentration greater than criteria indicated.

TABLE B.3

GROUNDWATER SAMPLING RESULTS - METALS AND GENERAL CHEMISTRY
HIMCO SITE
ELKHART, INDIANA

Sample Location:					*WT116A*	*WT116B*	*WT117A*	*WT117B*	*WT117C*	*WT117C*	*WT117D*	*WT118B*
Sample ID:					*GW-WT116A-091510*	*GW-WT116B-091510*	*GW-WT117A-090810*	*GW-WT117B-090810*	*GW-WT117C-090810*	*GW-WT117C-090810-D*	*GW-WT117D-090810*	*GW-WT118B-091010*
Sample Date:					*9/15/2010*	*9/15/2010*	*9/8/2010*	*9/8/2010*	*9/8/2010*	*9/8/2010*	*9/8/2010*	*9/10/2010*
		USEPA	*USEPA*	*RDA*						*Duplicate*		
Parameters	*Units*	*Primary MCL*	*Secondary MCL*	*Criteria*								
		a	*b*	*c*								
Metals												
Aluminum	µg/L	-	50	-	50.0 U	50.0 U	1890[b]	50.0 U	50.0 U	50.0 U	35.2 J	50.0 U
Antimony	µg/L	6	-	-	0.40 J	2.0 U	0.28 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	µg/L	10	-	-	4.4	1.2	1.0 U	1.7	0.68 J	0.67 J	3.3	2.7
Barium	µg/L	2000	-	-	76.4 J	186 J	50.8 J	87.3 J	192 J	187 J	54.8 J	61 2 J
Beryllium	µg/L	4	-	-	1.0 U	0.68 J	1.0 U	1 0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cadmium	µg/L	5	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1 0 U	1.0 U	1.0 U	1.0 U
Calcium	µg/L	-	-	250000	617000[c]	175000	69300	181000	268000[c]	259000[c]	121000	171000
Chromium	µg/L	100	-	-	10.0 U	10.0 U	2.9 J	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Cobalt	µg/L	-	-	-	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U
Copper	µg/L	1300	1000	-	13.4 J	5.8 J	25.0 U	25.0 U	25 0 U	25.0 U	25.0 U	25.0 U
Iron	µg/L	-	300	1000	13400[bc]	4400[bc]	1050[bc]	6710[bc]	3870[bc]	3760[bc]	5970[bc]	6020[bc]
Lead	µg/L	15	-	-	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Magnesium	µg/L	-	-	-	37500	14400	10200	16600	20000	19500	30400	19100
Manganese	µg/L	-	50	-	423[b]	143[b]	233[b]	187[b]	412[b]	401[b]	160[b]	139[b]
Mercury	µg/L	2	-	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	µg/L	-	-	-	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U
Potassium	µg/L	-	-	-	23400 J	7040	1670 J	4110 J	4320 J	4210 J	2490 J	4050 J
Selenium	µg/L	50	-	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Silver	µg/L	-	100	-	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Sodium	µg/L	-	-	150000	162000[c]	26900	7710	28300	36000	35000	17300	23000
Thallium	µg/L	2	-	-	1.0 U	1.0 U	0.20 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	µg/L	-	-	-	1.0 J	50.0 U	3.4 J	50.0 U	0.98 J	50.0 U	50.0 U	50.0 U
Zinc	µg/L	-	5000	-	20 0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U
General Chemistry												
Bromide	mg/L	-	-	-	3.9	0.29 J	0.50 U	0.19 J	0.30 J	0.30 J	0.50 U	0.50 U
Chloride	mg/L	-	250	-	16.1	34.4	4.5	38.7	32.9	32.8	32.5	34.4
Cyanide (total)	mg/L	0.2	-	-	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0 010 U	0.010 U
Sulfate	mg/L	-	250	-	694[b]	198	50.2	214	311[b]	316[b]	271[b]	208

Notes:

J Value is estimated.
U Not present at or above the associated value.
* Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water.
If more than 10% of tap water samples exceed the action level, water systems must take additional steps.
For copper, the action level is 1.3 mg/L and for lead, the action level is 0.015 mg/L.
The action level is discussed herein because there is no primary MCL for lead.
The action level applies to public water treatment facilities, and is included herein for discussion purposes only
\- Not applicable.
$\boxed{326000^{c}}$ Concentration greater than criteria indicated.

TABLE B.3

GROUNDWATER SAMPLING RESULTS - METALS AND GENERAL CHEMISTRY
HIMCO SITE
ELKHART, INDIANA

Sample Location:					*WT119B*	*WT120A*	*WT120B*	*WTB1*	*WTB3*	*WTB4*	*WTE1*	*WTE3*	*WTO2*
Sample ID:					*GW-WT119B-091510*	*GW-WT120A-090910*	*GW-WT120B-090910*	*GW-WTB1-091510*	*GW-WTB3-091510*	*GW-WTB4-091510*	*GW-WTE1-091410*	*GW-WTE3-091410*	*GW-WTO2-091310*
Sample Date:					*9/15/2010*	*9/9/2010*	*9/9/2010*	*9/15/2010*	*9/15/2010*	*9/15/2010*	*9/14/2010*	*9/14/2010*	*9/13/2010*
Parameters	*Units*	*USEPA Primary MCL a*	*USEPA Secondary MCL b*	*RDA Criteria c*									
Metals													
Aluminum	µg/L	-	50	-	**260**[b]	23.8 J	33.0 J	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	39.0 J
Antimony	µg/L	6	-	-	2.0 U	2.0 U	2 0 U	0.22 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	µg/L	10	-	-	2 7	4.2	6.7	1.0 U	5.7	0.97 J	1 5	2.8	2 4
Barium	µg/L	2000	-	-	75.9 J	74.0 J	88.9 J	140 J	73.8 J	44 9 J	45.8 J	68.3 J	88 2 J
Beryllium	µg/L	4	-	-	0.68 J	1.0 U	1.0 U	1.0 U	1 0 U	1 0 U	0.50 J	0 50 J	0.54 J
Cadmium	µg/L	5	-	-	1.0 U	1.0 U	1 0 U	1.0 U	1 0 U	1.0 U	1 0 U	1.0 U	1.0 U
Calcium	µg/L	-	-	250000	140000	82900	71300	45000	74800	67100	108000	72900	79700
Chromium	µg/L	100	-	-	3 0 J	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Cobalt	µg/L	-	-	-	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50 0 U	50.0 U	50.0 U	50 0 U
Copper	µg/L	1300	1000	-	5 5 J	25 0 U	25.0 U	25.0 U	25.0 U	25.0 U	25 0 U	25.0 U	25.0 U
Iron	µg/L	-	300	1000	**1100**[bc]	**1070**[bc]	**1030**[bc]	100 U	**1200**[bc]	**501**[b]	124	258	**1220**[bc]
Lead	µg/L	15	-	-	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3 0 U	3 0 U	3.0 U
Magnesium	µg/L	-	-	-	46700	21100	22600	24200	25500	23200	20000	29400	17400
Manganese	µg/L	-	50	-	**170**[b]	**91.6**[b]	**227**[b]	15.0 U	**513**[b]	**202**[b]	**124**[b]	31 8	**298**[b]
Mercury	µg/L	2	-	-	0.20 U	0.20 U	0.20 U	0 20 U	0.20 U	0 20 U	0.20 U	0.20 U	0.20 U
Nickel	µg/L	-	-	-	40 0 U	4 4 J	40 0 U	5.3 J	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U
Potassium	µg/L	-	-	-	11400	2110 J	1120 J	2380 J	1270 J	5000 U	3110 J	2360 J	2090 J
Selenium	µg/L	50	-	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 0 U	5.0 U	5.0 U
Silver	*µg/L*	-	*100*	-	*10.0 U*	*10.0 U*	*10.0 U*	*10.0 U*	*10.0 U*	*10.0 U*	*10.0 U*	*10.0 U*	*10.0 U*
Sodium	µg/L	-	-	150000	50600	41100	13400	61200	18400	4400 J	20200	16100	19100
Thallium	µg/L	2	-	-	1.0 U	0 21 J	1.0 U	1.0 U	0.23 J	1 0 U	1.0 U	0 19 J	1 0 U
Vanadium	µg/L	-	-	-	5.6 J	50 0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50.0 U	50 0 U
Zinc	µg/L	-	5000	-	20.0 U	20.0 U	20.0 U	20.0 U	20 0 U	20.0 U	20.0 U	20.0 U	20.0 U
General Chemistry													
Bromide	mg/L	-	-	-	0.58	0.50 U	0 50 U	0.18 J	0.50 U	0.50 U	0.50 U	0.097 J	0.50 U
Chloride	mg/L	-	250	-	31.6	94 9	28 1	64.6 J	53.8	37.9	34.7	10.4	40.5
Cyanide (total)	mg/L	0.2	-	-	0.015	0.0070 J	0.010 U	0.010 U	0.010 U	0 010 U	0.025	0 010 UJ	0.0095 J
Sulfate	mg/L	-	250	-	**260**[b]	50.0	79.9	0.33 J	77 7	23 1	78.6	3 7	97.0

Notes:

J	Value is estimated.
U	Not present at or above the associated value.
*	Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1 3 mg/L and for lead, the action level is 0 015 mg/L. The action level is discussed herein because there is no primary MCL for lead The action level applies to public water treatment facilities, and is included herein for discussion purposes only
-	Not applicable.
326000[c]	Concentration greater than criteria indicated.

TABLE B.3

GROUNDWATER SAMPLING RESULTS - METALS AND GENERAL CHEMISTRY
HIMCO SITE
ELKHART, INDIANA

Sample Location:					*WTO3*	*WTO4*
Sample ID:					*GW-WTO3-091310*	*GW-WTO4-091310*
Sample Date:					*9/13/2010*	*9/13/2010*
Parameters	*Units*	*USEPA Primary MCL a*	*USEPA Secondary MCL b*	*RDA Criteria c*		
Metals						
Aluminum	µg/L	-	50	-	81.1[b]	182[b]
Antimony	µg/L	6	-	-	2.0 U	2.0 U
Arsenic	µg/L	10	-	-	6.5	10.0
Barium	µg/L	2000	-	-	68.0 J	60.1 J
Beryllium	µg/L	4	-	-	1.0 U	1.0 U
Cadmium	µg/L	5	-	-	1.0 U	1.0 U
Calcium	µg/L	-	-	250000	53100	54100
Chromium	µg/L	100	-	-	10.0 U	10.0 U
Cobalt	µg/L	-	-	-	50.0 U	50.0 U
Copper	µg/L	1300	1000	-	25.0 U	25.0 U
Iron	µg/L	-	300	1000	568[b]	1630[bc]
Lead	µg/L	15	-	-	3.0 U	3.0 U
Magnesium	µg/L	-	-	-	17500	18100
Manganese	µg/L	-	50	-	38.1	171[b]
Mercury	µg/L	2	-	-	0.20 U	0.20 U
Nickel	µg/L	-	-	-	40.0 U	40.0 U
Potassium	µg/L	-	-	-	916 J	1130 J
Selenium	µg/L	50	-	-	5.0 U	5.0 U
Silver	µg/L	-	100	-	10.0 U	10.0 U
Sodium	µg/L	-	-	150000	4260 J	5940
Thallium	µg/L	2	-	-	1.0 U	1.0 U
Vanadium	µg/L	-	-	-	50.0 U	50.0 U
Zinc	µg/L	-	5000	-	20.0 U	20.0 U
General Chemistry						
Bromide	mg/L	-	-	-	0.50 U	0.50 U
Chloride	mg/L	-	250	-	1.2	3.2
Cyanide (total)	mg/L	0.2	-	-	0.010 U	0.010 U
Sulfate	mg/L	-	250	-	13.3	7.8

Notes:

J Value is estimated.
U Not present at or above the associated value.
* Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water.
If more than 10% of tap water samples exceed the action level, water systems must take additional steps.
For copper, the action level is 1.3 mg/L and for lead, the action level is 0.015 mg/L.
The action level is discussed herein because there is no primary MCL for lead.
The action level applies to public water treatment facilities, and is included herein for discussion purposes only
\- Not applicable.
326000[c] Concentration greater than criteria indicated.

APPENDIX C

LABORATORY REPORTS AND DATA VALIDATION MEMORANDA

APPENDIX D

GROUNDWATER SAMPLING STABILIZATION PARAMETERS

TABLE D.1

GROUNDWATER SAMPLING STABILIZATION PARAMATERS
GROUNDWATER SAMPLING RESULTS - SEPTEMBER 2010
HIMCO SITE
ELKHART, INDIANA

Sample Location:		*WT101A*	*WT101B*	*WT101B*	*WT101C*	*WT101D*	*WT101E*	*WT103A*
Sample ID:		*GW-WT101A-091410*	*GW-WT101B-091410*	*GW-WT101B-091410-D*	*GW-WT101C-091410*	*GW-WT101D-091410*	*GW-WT101E-091410*	*GW-WT103A-091510*
Sample Date:		*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/14/2010*	*9/15/2010*
				Duplicate				
	Units							
Field Parameters								
Conductivity	µS/cm	1.57	0.938	0.938	0.467	0.683	0.701	0.808
Dissolved oxygen (DO), field	mg/L	0.61	0.32	0.32	0.67	0.54	0.65	0.26
Oxidation reduction potential (ORP), field	millivolts	-230	-347	-347	-201	-196	-234	-240
pH, field	s.u.	7.03	7.14	7.14	7.68	7.51	7.43	7.42
Temperature (sample)	Deg C	16.63	18.68	18.68	14.11	14.05	13.91	23.04
Turbidity	NTU	3.93	12.5	12.5	4.36	0.38	0.36	7.76

Notes:

mS/cm	milliSiemens per cm
mg/L	milligrams per litre
s.u.	standard units
NTU	Nephelometric Turbidity Units

TABLE D.1

GROUNDWATER SAMPLING STABILIZATION PARAMATERS
GROUNDWATER SAMPLING RESULTS - SEPTEMBER 2010
HIMCO SITE
ELKHART, INDIANA

Sample Location:		*WT104A*	*WT105A*	*WT106A*	*WT106B*	*WT111A*	*WT114A*	*WT114B*
Sample ID:		*GW-WT104A-090810*	*GW-WT105A-090810*	*GW-WT106A-090910*	*GW-WT106B-090910*	*GW-WT111A-091010*	*GW-WT114A-090910*	*GW-WT114B-090910*
Sample Date:		*9/8/2010*	*9/8/2010*	*9/9/2010*	*9/9/2010*	*9/10/2010*	*9/9/2010*	*9/9/2010*
	Units							
Field Parameters								
Conductivity	µS/cm	0.186	0.429	0.879	1.32	1.55	2.48	0.636
Dissolved oxygen (DO), field	mg/L	0.81	0.21	0.60	0.56	0.60	0.57	0.60
Oxidation reduction potential (ORP), field	millivolts	-4	-36	-107	-148	-101	-158	-164
pH, field	s.u.	8.3	7.49	7.3	7.21	6.67	7.3	7.21
Temperature (sample)	Deg C	18.71	16.42	14.93	13.1	13.81	15 07	13.54
Turbidity	NTU	-	1.07	1.82	0.97	2.9	2.79	1.12

Notes:

mS/cm	milliSiemens per cm
mg/L	milligrams per litre
s.u.	standard units
NTU	Nephelometric Turbidity Units

TABLE D.1

GROUNDWATER SAMPLING STABILIZATION PARAMATERS
GROUNDWATER SAMPLING RESULTS - SEPTEMBER 2010
HIMCO SITE
ELKHART, INDIANA

Sample Location:		*WT114C*	*WT115A*	*WT116A*	*WT116B*	*WT117A*	*WT117B*	*WT117C*
Sample ID:		*GW-WT114C-090910*	*GW-WT115A-091510*	*GW-WT116A-091510*	*GW-WT116B-091510*	*GW-WT117A-090810*	*GW-WT117B-090810*	*GW-WT117C-090810*
Sample Date:		*9/9/2010*	*9/15/2010*	*9/15/2010*	*9/15/2010*	*9/8/2010*	*9/8/2010*	*9/8/2010*
	Units							
Field Parameters								
Conductivity	µS/cm	0.594	1.39	3.82	1.13	0.393	1.11	1.51
Dissolved oxygen (DO), field	mg/L	0.71	0.48	0.62	0.72	0.91	0.39	0.70
Oxidation reduction potential (ORP), field	millivolts	-246	-265	-133	-260	26	-99	-70
pH, field	s.u.	7.46	6.88	6.84	7.07	6.84	6.93	6.81
Temperature (sample)	Deg C	14.31	17.72	1326	13.04	14.85	12.61	12.26
Turbidity	NTU	0.65	206	4.63	1.97	17.2	0.42	0.46

Notes:

mS/cm	milliSiemens per cm
mg/L	milligrams per litre
s.u.	standard units
NTU	Nephelometric Turbidity Units

TABLE D.1

GROUNDWATER SAMPLING STABILIZATION PARAMATERS
GROUNDWATER SAMPLING RESULTS - SEPTEMBER 2010
HIMCO SITE
ELKHART, INDIANA

Sample Location:		*WT117C*	*WT117D*	*WT118B*	*WT119B*	*WT120A*	*WT120B*	*WTB1*
Sample ID:		*GW-WT117C-090810-D*	*GW-WT117D-090810*	*GW-WT118B-091010*	*GW-WT119B-091510*	*GW-WT120A-090910*	*GW-WT120B-090910*	*GW-WTB1-091510*
Sample Date:		*9/8/2010*	*9/8/2010*	*9/10/2010*	*9/15/2010*	*9/9/2010*	*9/9/2010*	*9/15/2010*
		Duplicate						
	Units							
Field Parameters								
Conductivity	µS/cm	1.51	0.856	1.06	1.058	0.767	0.597	0.629
Dissolved oxygen (DO), field	mg/L	0.70	1.17	0.72	0.89	0.60	0.30	1.11
Oxidation reduction potential (ORP), field	millivolts	-70	-143	-231	-127	-209	-265	-53
pH, field	s.u.	6.81	7.34	7.31	6.8	7.65	7.72	8.18
Temperature (sample)	Deg C	12.26	13.15	12 65	19.11	13.38	12.87	12.33
Turbidity	NTU	0.46	1.51	0.8	4.08	1.94	2.01	1.49

Notes:

mS/cm	milliSiemens per cm
mg/L	milligrams per litre
s.u.	standard units
NTU	Nephelometric Turbidity Units

TABLE D.1

GROUNDWATER SAMPLING STABILIZATION PARAMATERS
GROUNDWATER SAMPLING RESULTS - SEPTEMBER 2010
HIMCO SITE
ELKHART, INDIANA

Sample Location:		*WTB3*	*WTB4*	*WTE1*	*WTE3*	*WTO2*	*WTO3*	*WTO4*
Sample ID:		*GW-WTB3-091510*	*GW-WTB4-091510*	*GW-WTE1-091410*	*GW-WTE3-091410*	*GW-WTO2-091310*	*GW-WTO3-091310*	*GW-WTO4-091310*
Sample Date:		*9/15/2010*	*9/15/2010*	*9/14/2010*	*9/14/2010*	*9/13/2010*	*9/13/2010*	*9/13/2010*
	Units							
Field Parameters								
Conductivity	µS/cm	0.63	0.507	0.767	0.587	0.642	0.408	0.424
Dissolved oxygen (DO), field	mg/L	0.51	0.33	0.48	0.41	0.83	0.67	0.61
Oxidation reduction potential (ORP), field	millivolts	-233	-307	-259	-343	-241	-219	-158
pH, field	s.u.	7.65	7.67	7.36	7.15	7.5	6.9	7.67
Temperature (sample)	Deg C	12.96	14.21	12.99	15.85	13.4	14.09	14.07
Turbidity	NTU	1.05	1.34	1.31	2.74	3.39	5	12

Notes:

mS/cm	milliSiemens per cm
mg/L	milligrams per litre
s.u.	standard units
NTU	Nephelometric Turbidity Units